

**Canon** Video Product  
SERVICE MANUAL

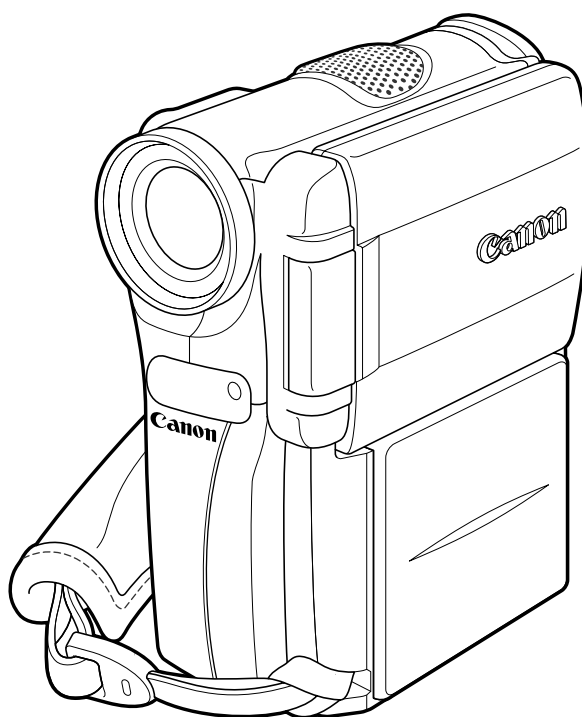
Mini DV Digital  
Video  
Cassette

# ELURA20 MC A ELURA10 A

No. D17-6512  
D17-6522

Digital Video Camera

NTSC



Canon Inc.  
Digital Imaging Products Service Dept.





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# CHAPTER 1. GENERAL DESCRIPTION

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## 1. Product Overview

Strategic product with a 3x recording mode, memory card functions and analog line input (iPAL) that are newly developed in the camcorder industries. Also, it succeeds the super compact size of the ELURA2 MC A with more sophisticated exterior design and enhances the picture quality.

## 2. Product Features

- Compact vertical (magnesium alloy) body
- 1/4-inch progressive scan 680,000-pixel CCD RGB primary color filters
- 2.5-inch 200,000-Pixel LCD monitor
- Digital input/output (DV jack), analog input/output AV insert function
- Card still image recording, multi-media card, SD memory card capability (MC model only)
- Card mix function (MC model only)
- SDL mode (max. recording time 240 min. : ELP mode using 80 min. tape)
- Multi-screen
- 3-element microphone
- Adequate accessories (New : 1 types of optical accessories, compact power supply)
- User-friendly card functions (Card preview, card playback jump functions)

## External Appearance

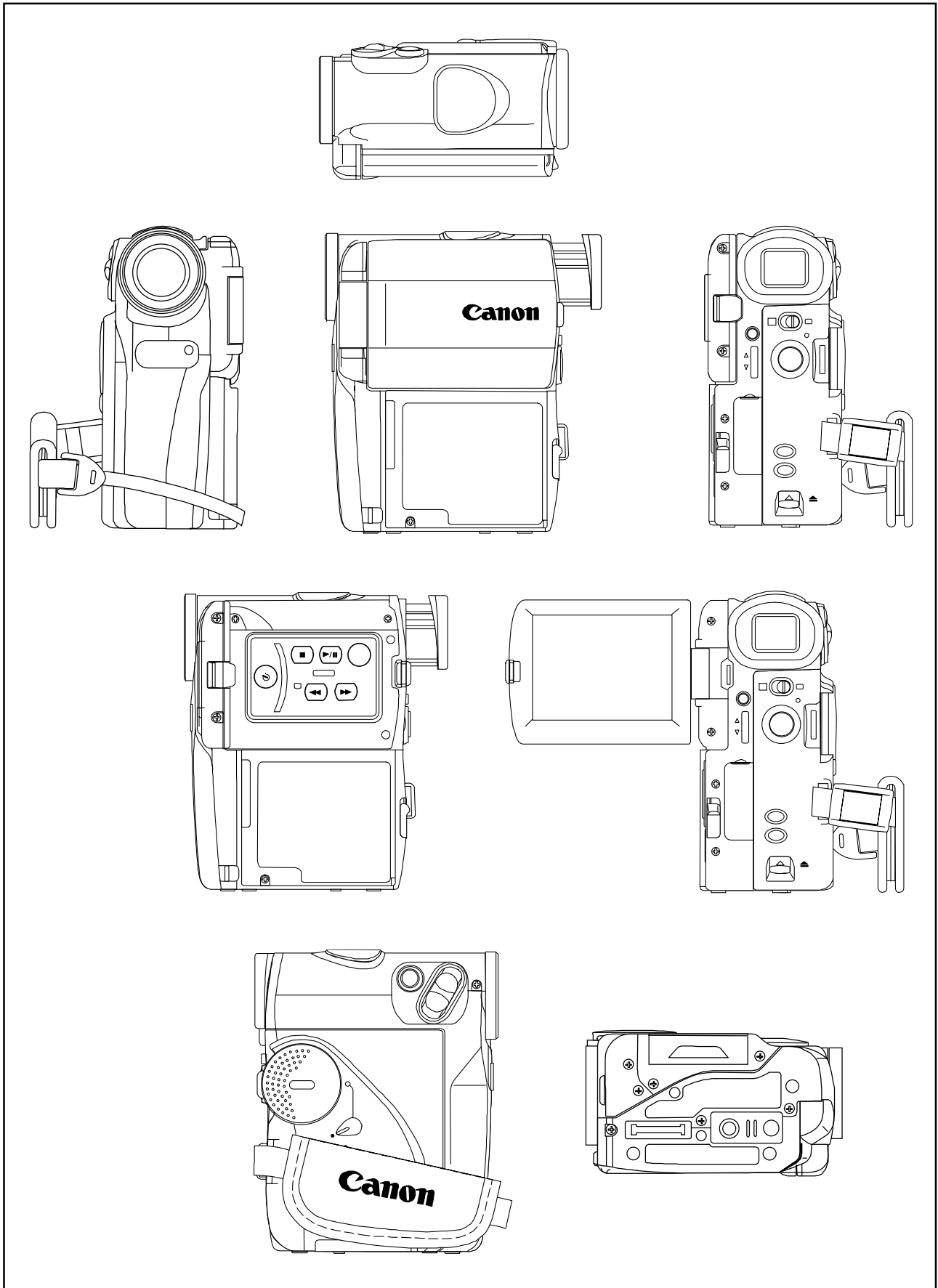


Fig. 1-1

## 2-1 Comparative List for Functions and Performance

Item		ELURA2 MC A, ELURA2 A	ELURA20 MC A, ELURA10 A (this device)
Camera			
Imaging(video) element	Image size	1/4-inch CCD	←
	Number of pixels	Total number of pixels : 680,000 Effective number of pixels : 360,000	←
	System	Progressive scan	←
	Filter	RGB primary color filters	←
Lens	Optical zoom ratio	10 ×	←
	Digital zoom ratio	40 × (10 × 4)	←
	Focal length	3.5-35mm	←
	(Converted to 35mm film)	44.7-447mm	←
	F number	F1.6-2.6	←
	Zoom speed	Variable	←
	Filter diameter	27mm	←
Minimum brightness		7.5 (3.5) lux (low-light mode NTSC: 1/30 sec)	←
Hand jitter compensation		Electronic type	←
Recording function			
Program AE		<input type="checkbox"/> (Full auto) <input checked="" type="checkbox"/> (Auto/Sports/Portrait/Spotlight/ Surf(sand)& snow/Low-light)	←
Light metering system	Lower center weighted averaged metering	Full auto mode, Auto mode, Sports mode, Portrait mode, Low light mode	←
	Evaluation metering	128 sectors (spotlight mode, surf (sand) & snow mode)	←
Exposure adjustment	AE lock	●	←
	Exposure compensation	● (after AE lock)	←
	AE shift	×	←
	Gain setting/Higher sensitivity	×	←
	Backlight compensation	×	←
Shutter speed	High-speed shutter	6 steps (1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000)	←
	Slow shutter	1 step (1/30 (Low-light, AE mode))	←
Aperture		Auto iris	←
Image quality adjustment (Custom preset)	Color gain adjustment	×	←
	Color phase adjustment	×	←
	Sharpness adjustment	×	←
	Setup adjustment	×	←
WB	Auto	●	←
	Set	● (1 pc.)	←
	Preset	Outdoors/indoors	←
	System	TTL, 128 sectors	←
Focus	Mode	AF/MF	←
	Manual focus	Multi-dial operation	←
16:9	Recording system	Vertical extension system	←
	Area marker display	×	←
Recording effects	D. effect	Art, black & white, sepia, mosaic	←
	D. fade	White(black)auto, wipe(right & left), scroll, mosaic	White(black)auto, wipe(right & left), scroll, mosaic
	Multi-screen	4/9/16 screen (MC model only)	← (MC model only)
Zebra pattern		×	←

Item		ELURA2 MC A, ELURA2 A	ELURA20 MC A, ELURA10 A (this device)
Recording function			
Color bar		×	←
Movie recording	Framed movie	Progressive scan	←
	Self-timer	10 sec/remote control : 2 sec	←
	Interval timer	×	←
	Clear scan	×	←
Still image recording (tape)	Recording system	Frame recording (MC model only) (Field recording for card mix)	← (MC model only)
	Recording time	6.5 sec.	6.5 sec. (ESP/ELP: approx. 8 sec.)
	Frame processing	Progressive scan	←
Still image recording (Card)	Recording system	Frame recording (MC model only)	← (MC model only)
	Recorded image size/file system	640 (H) × 480 (V) / JPEG (MC model only)	← (MC model only)
	Memory card	Multi-media card	Multi-media card, SD memory card
REC search		●	←
REC review		●	←
Card review		×	★ (MC model only)
Standby SW		×	←
Power save(after 5-min. recording pause)		Power shutoff	←
Displayed character recording		×	←
Audio		16 bits 2 ch (48KHz) 12 bits 4 ch (32KHz)(No sync 4-ch recording)	←
Wind cut		● ON/OFF switch (for built-in microphone only)	←
EVF	Size	0.44-inch (color TFT)	←
	Number of pixels	113,000 pixels	←
	Brightness adjustment	×	←
	Color adjustment	×	←
	Portable	×	←
Monitor LCD	Size	2.5-inch	←
	Number of pixels	200,000 pixels	←
	Brightness adjustment	×	←
	Portable	● Mirror photography capability	←
VCR			
Playback system	Frame forward play	Forward/reverse	←
	Slow play	Forward/reverse	←
	2× speed play	Forward/reverse	←
	1× speed play	Forward/reverse	←
	Queue/review	9.5 × speed play	←
Search	Photo search	●	←
	Date search	●	←
	Index search	×	←
Play effect	D. effect	Art, black & white, sepia, mosaic	←
	D. fade	White(black)auto, wipe(right & left), scroll, mosaic	←
	Multi-screen	4/9/16 screen (MC model only)	← (MC model only)
Data code display		Date display/camera data	←
Slide show		● (MC model only)	← (MC model only)
Card playback jump		×	★ (MC model only)
Audio dubbing		●	←
AV insert	Digital	●	←
	Analog	●	←
Zero set memory		●	←

Item		ELURA2 MC A, ELURA2 A	ELURA20 MC A, ELURA10 A (this device)
VCR			
Edit function	Simple edit	×	←
	Effects	×	←
Systems			
I/F(jack)	Microphone input	● (DC 5V jack, DU-300 capability)	←
	Headphone output	● (DU-300 capability)	←
	DV jack	● (input/output)	←
	S jack	● (input/output, DU-300 capability)	← (input/output, DU-300 capability)
	AV jack	input/output RCA pin (also used for VA)	← (also used for VA)
Edit capability		LANG jack (DU-300 capability)	←
World clock		●	←
Character title		×	←
Speaker		●	←
Warning buzzer		●	←
Tally lamp		●	←
Remote control		Ⓢ 1, Ⓢ 2 capability	←
Accessory shoe		×	←
Video ID		● (ID1)	←
Recording mode	LP	●	←
	SDL (Ⓢ SP, Ⓢ LP)	×	★
Custom key		×	←
Index screen key		×	★ (MC model only)
Mix/slide show key		×	★ (MC model only)
DV control		×	←
Main unit charging		×	←
Backup power supply		Button type lithium battery (CR-1616 type)	←
Battery pack power supply		Lithium battery, 400 series	←

Changed from D52A/B models (★ : New functions)



### 3. Performance / Functions

		ELURA20 MC A, ELURA10 A	
1	Type	Video camcorder	
2	Recording system	Rotary 3-head helical scan azimuth recording. Personal digital DVC (SD/SDL standard). Conforms to the NTSC system (525 lines x 60 fields).	
2-1	Video signal recording system	Digital component recording.	
		SD	SDL
	Sampling frequency	Y = 13.5MHz R-Y, B-Y = 3.375MHz	Y = 10.125MHz R-Y, B-Y = 3.375MHz
	Number of quantified bits	8bits	8bits
2-2	Audio signal recording system	PCM digital recording. 16-bit, 48KHz 2 channels 12-bit, 32KHz 2 channels (stereo 1, 2)	PCM digital recording. ----- 32KHz 2ch (stereo1)
2-3	Tracking	2-frequency pilot type	2-frequency pilot type
2-4	Tape speed	Approx. 18.81mm/sec. (SP mode) Approx. 12.56mm/sec. (LP mode)	Approx. 9.41mm/sec. (ESP mode) Approx. 6.28mm/sec. (ELP mode)
2-5	Head drum		
	Drum diameter	21.7mm	
	Speed	9000/1.001 rpm	
	Number of heads	3 video heads	
3	Record/play times	Max. 80 min. (SP mode) Max. 120 min. (LP mode)	Max. 160 min. (ESP mode) Max. 240 min. (ELP mode)
	Continuous recording time	BP-406 BP-412 BP-422	Approx. 55 min. (CVF), Approx 45 min. (LCD) Approx. 100 min. (CVF), Approx 80 min. (LCD) Approx. 200 min. (CVF), Approx 165 min. (LCD)
4	Usable video cassettes	Mini-DVC specifications.	
4-1	Tape type	Evaporated metal tape.	
4-2	Tape width	6.35mm evaporated metal tape.	
4-3	Tape thickness	7μm	
5	Camera		
5-1	Video element	1/4 (1/4-inch) type progressive scan CCD.	
	5-1-1 Number of pixels	Total number of pixels: approx. 680,000 Effective number of pixels: approx. 360,000	
	5-1-2 Filters	RGB primary color filters.	
	5-1-3 Color separation system	Differential read-out type.	
	5-1-4 Signal configuration	NTSC standard color video signal	
	5-1-5 Scan system	525 lines x 60 fields / 30 frames	
5-2	Optical lens		
	5-2-1 Nominal focal length	3.5mm - 35mm	
	Zoom ratio (Converted to 35mm film)	Optical lens: 10× Electronic zoom: 40× (10× 4 = 40) 44.7mm - 447mm 1788mm (equivalent)	
	5-2-2 Nominal aperture ratio	1 : 1.6 (F2.6 at Tele photo-end)	
	5-2-3 Lens configuration	10 elements, 7 groups, 2 aspherical lens elements (3 surfaces) used.	
	5-2-4 Focusing	Inner focus type. Manual focusing is also possible (by rotating the Multi dial).	
	5-2-5 Minimum focusing distance	10mm (autofocus at Wide). 1m (from the front of the lens) throughout the entire zoom range.	
	5-2-6 Power zoom	Multi-step, variable speed power zoom. Slide lever type. The zoom speed is varied by the amount of slide lever movement. Optical zoom: approx. 2.0 sec. - approx. 21 sec. Digital zoom: approx. 3.5 sec. - approx. 24 sec. No manual zoom (no zoom ring).	
	5-2-7 Focal length indication	None. There is a simple zoom display in the viewfinder.	
	5-2-8 Macro mechanism	Wide angle end macro.	
	5-2-9 Minimum macro focusing distance	10mm (from front of lens).	
	5-2-10 Filter diameter	27mm, P0.5mm	
	5-2-11 Accessory lenses, filter	FS-27U can be used.	
	5-2-12 Lens hood	None.	
	5-2-13 Lens cap	Covering type.	

5-3	Hand jitter compensation	Yes
5-3-1	Type	Electronic type hand jitter compensaion
5-3-2	Hand jitter detection	Angular velocity detecting method.
5-4	Recording modes	Movie mode, photo mode (tape and card recording (card for ELURA 20 MC A only)).
5-4-1	Movie mode	Normal recording and progressive scan recording.
5-4-2	Photo mode	Approx. 6.5 sec. (approx. 8 sec. int the ESP mode and ELP mode) still image recording (field recording for card mix in frame record and movie mode) Lock display ( ) in the viewfinder after partially pressing the button. This display lights green when the AF lock is applied.
5-4-3	Card recording	CCD Prograssive still images can be recorded an still images on MMC (Multi-Media cards) or SD (Secure Digital) memory card by pressing the Photo button int the card recording mode. A shutter tone (pseudo) will sound at his sound at this time.
	Recording system JPEG.	JPEG system compressin ratio (fine/standard) available. Conforms to DCF (Design rule for Camera File system).
	Recording system	JPEG system compensation ratio (irreversible) (fine/standard) available Conforms to DCF (Design rule for Camera File system).
	Number of recordable images (for SDC-8M)	
	Fine	Approx. 50
	Standard	Approx. 80
		The SDC-8M card supplied contains pre-recorded title images, so the above values will be smaller when this is used. The values are merely guidelines and can vary widely depending on the focal length used, the subject, the conditions, etc.
5-5	Exposure control	
5-5-1	AE function	
	Program AE	Full auto mode, auto mode, sports mode, portrait mode, spotlight mode, surf (sand) & snow mode, low light mode.
5-5-2	Light metering system	Below-center weighted averaging metering : Full auto Mode, Auto Mode, Sports Mode, Portrait Mode, Low Light Mode. Full frame averaged metering + 128-sector evaluation metering : Spotlight Mode, Surf (Sand) & Snow Mode.
	Frame division	128 sectors (16 vertical x 8 horizontal)
5-5-3	Exposure compensation function	
	AE lock	AE lock by AE shift button operation AE lock uses the Multi-dial for Exposure compensation (except in Full Auto mode).
	Exposure Compensation volume	+/-11 steps (+/-2.75EV), 0.25 aperture stop per step. Bar indicator ( ) in the viewfinder.
5-5-4	Electronic shutter	
	High-speed shutter	Auto mode : 1/60 sec., 1/100 sec., 1/250 sec., 1/500 sec., 1/1000 sec., 1/2000 sec.  Hand jitter compensation ON                  During flicker detection : 1/100 sec. During flicker detection : 1/120 sec.  Hand jitter compensation OFF                During flicker detection : 1/100 sec.
	Low-speed shutter	1/30 sec. (low light mode, fixed speed)
5-6	Autofocus (AF)	
5-6-1	System	TTL, video signal detection auto focus type AF.
5-6-2	AF measurement area	Center of screen
5-6-3	Metering frame display	None.
5-6-4	AF operational range	10mm - infinity (Wide); 1m - infinity (from front of lens) throughout the entire zoom range.
5-6-5	AF operational brightness range	50 lux - 100,000 lux
5-6-6	AF mode selection	Continuous AF/manual focusing. AF can be turned on and off by pressing the focus button in all modes except full auto. (Pressing focus button)
	Manual focus	► M . F O C U S is displayed in the viewfinder during manual focus (AF off).
5-7	Viewfinder	0.44-inch type, color liquid crystal display (approx. 113,000 pixels), telescoping type (pull out). Off except when the LCD monitor is stored (body side panel face) and during mirror mode.
5-7-1	Rotation	No.
5-7-2	Eyepiece removal	Yes.
5-7-3	Diopter adjustment range	+1.5 to -5.5 diopters (eyepiece).
5-7-4	Lens configuration	2 groups, 2 elements.

5-8 LCD panel	2.5-inch type, color liquid crystals, display approx. 200,000 pixels (228 (V) × 880 (H)). TFT active matrix drive. RGB delta array. On except when the LCD monitor is stored (body side panel face).
Angle adjustment	Yes. High angle, low angle, monitoring during mirror mode.
Data display	Operation mode display, simple zoom position display, battery level display, remaining tape display, time code, various warning. Color display. No display during mirror mode.

Relationships to the viewfinder (CVF)

LCD panel position	Camera mode/card recording <sup>*1</sup>		VCR mode/card playback <sup>*1</sup>	
	LCD panel	CVF	LCD panel	CVF
Panel closed (panel side of body)	OFF	ON	OFF	ON
Panel closed (panel side outside)	ON	OFF	ON	OFF
Panel opened	ON	OFF	ON	OFF
Mirror (photography) mode <sup>*3</sup>	ON <sup>*2</sup>	ON	ON	ON

\*1: ELURA20 MC A only

\*2: Appears in Mirror mode with menu operation.

\*3: Panel displays restricted to the following for Mirror mode. (Normal viewfinder and onscreen displays)

The following marks are indicated in the upper left of screen .

- Camera mode : "●" recording , "⬮" recording pause, "▲" ejection
- Card recording mode : "Ⓜ" without card , "Ⓜ<<<<" with card, accessing

(Mirror mode is reset in recording search and warning.)



5-9 White balance adjustment	TTL, 128-sector, new white extraction type FAWB. With set/preset (outdoors: 5,600K; indoors: 3,200K) (selection from camera menu).
Adjustment range	2,800K - 8,000K.
5-10 Digital feature function	Fader, effects, multi-screen, card mix (MC model only) modes are provided. Fader : Coupled to the start/stop button (VCR mode button), one-time execution is possible when the fader mode is displayed (the mode display disappears when the fader ends). Effects : Continuous effects are possible until turned off. Multi-screen : Images are captured and displayed on several screens at fixed intervals or as indicated manually. Displays continue until turned off. Card mix : The sample images supplied and images recorded on cards can be mixed and displayed with images captured with the camera.
5-10-1 Fader	Audio-synchronized fader. Auto fade (JAPAN models: White Fade; Overseas Models: Black Fade), Wipe (Left/Right), Scroll, Mosaic Fade.
Fade time	Approx. 4 sec.
5-10-2 Effects	Art, Monochrome, Sepia, Mosaic. Operated by pressing the Effects button to toggle this function ON and OFF.
5-10-3 Multi-screen	
Number of screens	4 (2 × 2, 9 (3 × 3), 16 (4 × 4)
Operation mode	Manual, fast (every 4 fields), normal (every 6 fields), slow (every 8 fields).
5-10-4 Card mix (MC model only)	
Mix type	Card chroma key, Card luminance key, Camera chroma key
Mix level adjustment	32 steps.

5-10-5 Relationship between digital features and operation mode

When execution is possible in the various modes (Card record mode, card play mode. Card mix only with the MC model.)

	Card record mode	Camera mode		VCR mode	Card playback mode
		Still Image	Movie		
Fader	x	x			x
Effects					x
Multi-screen					x
Card mix	x		<sup>*1</sup>	x	x

\*1: Not possible in the movie mode or low light mode (interlace).

5-11	Built-in microphone	Stereo microphone (electret condenser microphone used). Stereo using on-directional microphone × 3 + electrical circuit (3-element microphone).
	5-11-1 Wind cut function	With on/off switch (menu selection for built-in microphone only).
5-12	Additional functions	
	5-12-1 Time code	Recording time (0:00:00 - 7:59:59) is displayed and recorded in the sub code area.
	5-12-2 Data code	There is no recording time display, but the recording date/time and camera data are recorded and can be displayed during play.
	Date/time	Coupling range: January 1, 2001 to December 31, 2030 (initial setting: January 1, 2001). World time capability. Automatic setting to the date/time of travel destinations by selecting the destination city. Daylight saving time capability. Three display modes are available for play: date, date and time, and time (January 1, 1990 to December 31, 2089).
	Camera data	Values such as shutter speed and aperture value are recorded (no display during recording) and can be displayed during play.
	5-12-3 Assessor shoe	None.
	5-12-4 Image search function	Tape can be played (forward/reverse) during camera recording pause by operating the Rec Search button.
	5-12-5 Rec review function	Started by operating the Rec Check button (⏮) during camera recording pause.
	5-12-6 Card review function	Yes (MC model only) The last image recorded on the memory card is read out by operating the REC Check button (⏮) on the card recording mode. The image read out can be protected or deleted.
	5-12-7 Zero set memory	Yes. Tape can be forwarded or rewound continuously until the zero set memory key of the WL-D75/WL-D76 is operated (The counter value is set to 0:00:00.) (Zero set is possible only during recording, not during play.)
	5-12-8 Remote control ON/OFF	Yes. Available in both the camera recording and the VCR modes (menu selection).
	5-12-9 Selftimer	10 sec. (Approximately 2 sec. when the wireless controller WL-D75/WL-D76 is used.)
	5-12-10 Headphone volume adjustment	Adjustment is possible using the multi-dial.
6	Recorder unit	
6-1	Recording functions	Camera recording, DV input recording, analog input recording.
	6-1-1 Recording format	Personal DVC (SD specifications).
	6-1-2 Tape speed	
	SD specifications	Approx. 18.81mm/sec. (SP mode), approx. 12.56mm/sec. (LP mode)
	SDL specifications	Approx. 9.41mm/sec. (ESP mode), approx 6.28mm/sec. (ELP mode)
	6-1-3 DV input recording	Conforms to IEEE 1394. Records video and audio signals from a digital video camera connected with the DV cable.
	6-1-4 Analog input recording	The S-video jack and AV mini-jack are used to record analog video and audio signals.
	6-1-5 Terminal priority during recording	DV jack > S-video jack > AV mini-jack
6-2	Insert recording	Yes.
	6-2-1 Insertable tape	Only tapes with SP recording can be inserted.
6-3	Dubbing	Yes (SD specification tape only)
	6-3-1 Tapes usable	Only tapes with 12-bit SP recording other than for audio dubbing 4-channel simultaneous recordings can be used for dubbing.
	6-3-2 Dubbing signal input	Line (AV mini-jack) or microphone (external/internal) audio signals.
	6-3-3 Dubbing selection	Operate the dubbing button of the remote control in play pause status.
6-4	Play functions	Standard play and special play
	6-4-1 Standard play	
	a. Video	Video recorded in the SP, LP,  SP or  LP mode
	b. Audio	
	16-bit	Sampling frequency 48KHz, 44.1KHz, 32KHz. (except for SDL specifications)
	12-bit	Sampling frequency 32KHz. Play using stereo 1, stereo 2 or a mix of stereo 1 and 2 (variable mix ratio).
	6-4-2 Special play	Video only play
	a. Freeze frame play	Movie picture : pure frame play Progressive : frame play
	b. Fast forward play	Approx. 9.5× speed.
	c. Rewind play	Approx. 9.5× speed.
	d. Frame forward play	Forward/reverse
	e. Slow play	Forward/reverse 1/5× speed (corresponds to forward/reverse 1/10× speed)
	f. 1× speed play	Forward/reverse
	g. 2× speed play	Forward/reverse 2× speed
	h. Edit search	Forward/reverse

6-5	Tape fast forward/rewind time	Approx. 2 min. 20 sec. (using 60-minute tape)
6-6	Input signals	
6-6-1	DV jack	IEEE 1394-AV/C protocol SD format signal.
6-6-2	AV mini-jack	
a.	Video signal	NTSC standard color video signal
	Impedance	75 $\Omega$
	Output signal level	1Vp-p (composite)
b.	Audio signal	
	Signal type	Stereo audio signal
	Impedance	47 K $\Omega$ or more
	Signal level	-10dBv
6-6-3	S-video jack (with Docking Unit DU-300 connected)	
	Signal configuration	Y/C separate video signal
	Impedance	75 $\Omega$
	Signal level	0.286Vp-p (composite) (color burst signal)
6-6-4	MIC jack (with docking unit DU-300 connected)	
		$\phi$ 3.5mm mini stereo jack
	Impedance	5 K $\Omega$ or more
	Signal level	-57dBv (using 600ohm microphone)
6-7	Output signals	
6-7-1	DV jack	IEEE 1394-AV/C protocol.
6-7-2	AV mini-jack	$\phi$ 3.5mm, 4-pole mini-jack.
a.	Video signal	
	Signal configuration	NTSC standard color video signal
	Impedance	75 $\Omega$
	Signal level	1Vp-p (composite)
b.	Audio output signal	
	Signal type	Stereo audio signal.
		AV mini-jack.
	Output impedance	3 K $\Omega$ or less.
	Output signal level	-10dBv (47-K $\Omega$ load).
	Frequency response	60Hz - 16KHz (1KHz standard: +/-3dB)
	Audio signal S/N ratio	
	Microphone input	48dB or more.
	External microphone input	48dB or more (using Docking Unit DU-300).
6-7-3	S-video jack (using Docking Unit DU-300).	
	Signal configuration	NTSC Y/C separate video signal.
	Video signal	1Vp-p (Brightness + sync signal)
	Color signal	0.286Vp-p (color burst signal)
	Brightness signal S/N ratio	45dB or more
6-7-4	Headphone jack (using Docking Unit DU-300).	
		$\phi$ 3.5mm stereo mini jack.
	Output impedance	150 $\Omega$
	Output signal level	-25dBv (16 $\Omega$ load, maximum volume).
6-8	Memory card system (MC model only)	
6-8-1	Memory card used	Multi-media card, SD memory card.
6-8-2	Recordable images and image qualities	
	Card record mode	: Camera images can be recorded by operating the Photo button. The digital effects function and multi-screen function can also be used.
	VCR mode	: Still images can be recorded by operating the Photo button (half-pressing freezes a frame and then full-pressing records) while playing a tape. Also, DV input images can also be recorded (no tape or tape stopped) by operating the Photo button (half-pressing freezes a frame and then full-pressing records).
		Image quality when recording from tape/DV input to a card.

Sorce	Record mode	Images recorded to a card
Progressive animated image Photo recorded on tape with ELURA20 MC A, ELURA10 A	NTSC/PAL model	Progressive frame image
Normal animated image	NTSC model	Simple viewer frame
	PAL model	Field image
DV input	NTSC model	Simple viewer frame
	PAL model	Field image

6-8-3 Recording system	JPEG file conforms to DCF (Design rule for Camera File system) and DPOF (Digital Print Order Format).
Card volume level	CANON_DV
DCF folder and file name	//DCIM/xxx CANON/AUT_yyyy.JPG   xxx : folder number   yyyy: file number
File numbers	Files are controlled internally by folder number and file number. File numbers from 0001 to 9900 are allocated to recorded images. Up to 100 images can be saved in each folder. Numbers from 100 - 998 are allocated to the folders.

Relationship between folder numbers and file numbers

Folder No.	File numbers	File contents
100	0001 0002 0003 .... 0099 0100	Sample images provided at the factory
101	0101 0102 0103 .... 0199 0200	Image recording area
102	0201 0202 0203 .... 0299 0300	
...		
198	9801 9802 9803 .... 9899 9900	
200	0001 0002 0003 .... 0099 0100	
...		
998	9801 9802 9803 .... 9899 9900	

Recorded images start from 101-0101. Basically, the numbers are allocated so that they are larger than the directory numbers and file numbers of the files stored in the multi-media card.

6-8-4 Recorded image size	640 (H) × 480 (V)
6-8-5 Number of images recorded	SDC-8M
Fine mode	Approx. 50
Standard	Approx. 80

6-8-6 Card format	The Format instruction on the menu of the body is used to format cards. Correct operation cannot be guaranteed when a personal computer is used for formatting because formatting may vary depending on the OS.
-------------------	---

6-9 Digital feature functions	Fader, effects, multi-screen modes are provided. Coupled to the ►/   button. Can be executed once when Fade mode is displayed (mode display turns OFF when fader ends). Effects : Continuous effects are possible until turned OFF. Multi-screen : Images are captured and displayed on several screens at fixed intervals or as indicated manually. Displays continue until turned OFF.
-------------------------------	---

6-9-1 Fader	Audio-synchronized fader. Auto fade (Japanese models : white fade; overseas models : black fade), wipe (left/right), scroll and mosaic fade.
-------------	---

Fade time                      Approx. 4 sec.

6-9-2 Effects	Art, monochrome, sepia, mosaic Operated by pressing the D. Effect button to toggle this function on and OFF.
---------------	---

6-9-3 Multi-screen	
Number of screens	4 (2 × 2), 9 (3 × 3), 16 (4 × 4)
Operation mode	manual, fast (every 4 frames), normal (every 6 frames), slow (every 8 frames)

6-9-4 Card mix	No
----------------	----

6-9-5 Relationship between digital features and operation mode

	VCR/tape	VCR/card (MC model only)
Fader		×
Effects		×
Multi-screen		×
Card mix function (MC mode only)	×	×

6-10 Other functions		
6-10-1	Editing mechanism	Used for recording pauses and stops. Also possible when the power is turned off. This function is not effective, when the cassette is removed.
6-10-2	Automatic stop mechanism	Activates after approx. 5 min. of continuous forward still image playback or approx. 2 min. of continuous reverse still image playback, when the condensation warning appears. when the end or beginning of a tape is reached.
6-10-3	Automatic power off mechanism	Operates when recording pause continues for approx. 5 min., and when the battery voltage drops below the specified value.
6-10-4	Time code	Automatic writing during recording. 0:00:00:00 - 7:59:59:29 (hour:minute:second:frame).
6-10-5	Photo search	Used to search for photos recorded in the Photo mode. Forward/reverse photo search (operate the ◀◀, ▶▶ keys after selecting Photo Search with the Search Select key of the remote control). Setting is possible for up to +/-10 numbers from the current position.
6-10-6	Date search	This function is used to specify the parts of dates that differ when recordings were made on multiple dates. Forward/reverse date search (operate the ◀◀, ▶▶ keys after selecting Date Search with the Search Select key of the remote control). Setting is possible for up to +/-10 numbers from the current position.
6-10-7	World clock display	After the reference city (the city for which the clock time has been set) has been set, the date and time of the selected city will automatically be changed to the local date and time, and recorded on the photo when a photo is taken.
6-10-8	Speaker	Built-in. With volume adjustment.
6-10-9	Battery charge function	None.
7 Terminals		
7-1	DV terminal	Special 4-pin connector (IEEE 1394 compatible), both input and output.
7-2	S-video terminal	4-pin mini DIN, both input and output (using Docking Unit DU-300).
7-3	Video/audio terminal	φ 3.5mm, 4-pole pin jack (yellow), both input and output.
7-4	External microphone input terminal	φ 3.5mm stereo mini jack (using Docking Unit DU-300).
7-5	Headphone terminal	φ 3.5mm stereo mini jack (using Docking Unit DU-300).
7-6	Edit terminal	φ 2.5mm mini-mini jack, LANC compatible (using Docking Unit DU-300).
7-7	Multi-media card connection terminal	Special multi-pin jack (MC model only).
7-8	Battery terminal	Special 4-pin jack.
8 Power supply		
8-1	Input power supply	7.4VDC (battery pack), 7.2VDC (using the CA-410, CB-400).
8-2	Power consumption	
	Recording (Autofocus)	Approx. 4.4 W (CVF), approx. 5.4 W (LCD monitor)
9	Size (W × H × D)	Approx. 48 × 106 × 86 mm (approx. 1-7/8 × 4-1/8 × 3-3/8 in.) (excluding small protuberances)
10 Mass (weight)		
10-1	Weight of main unit	Approx. 13 3/4 oz (390 g)
10-2	Total weight	Approx. 11b 5/8 oz (470 g) (Including BP-406, DVM-E30, lens cap, button type lithium battery, grip belt and SDC-8M (for MC model only))
12 Environmental conditions		
12-1	Performance guarantee conditions	0°C ~ 40°C 85% (relative humidity)
12-2	Operation guarantee conditions	-5°C ~ 45°C 65% (relative humidity)

## 4. System Charts

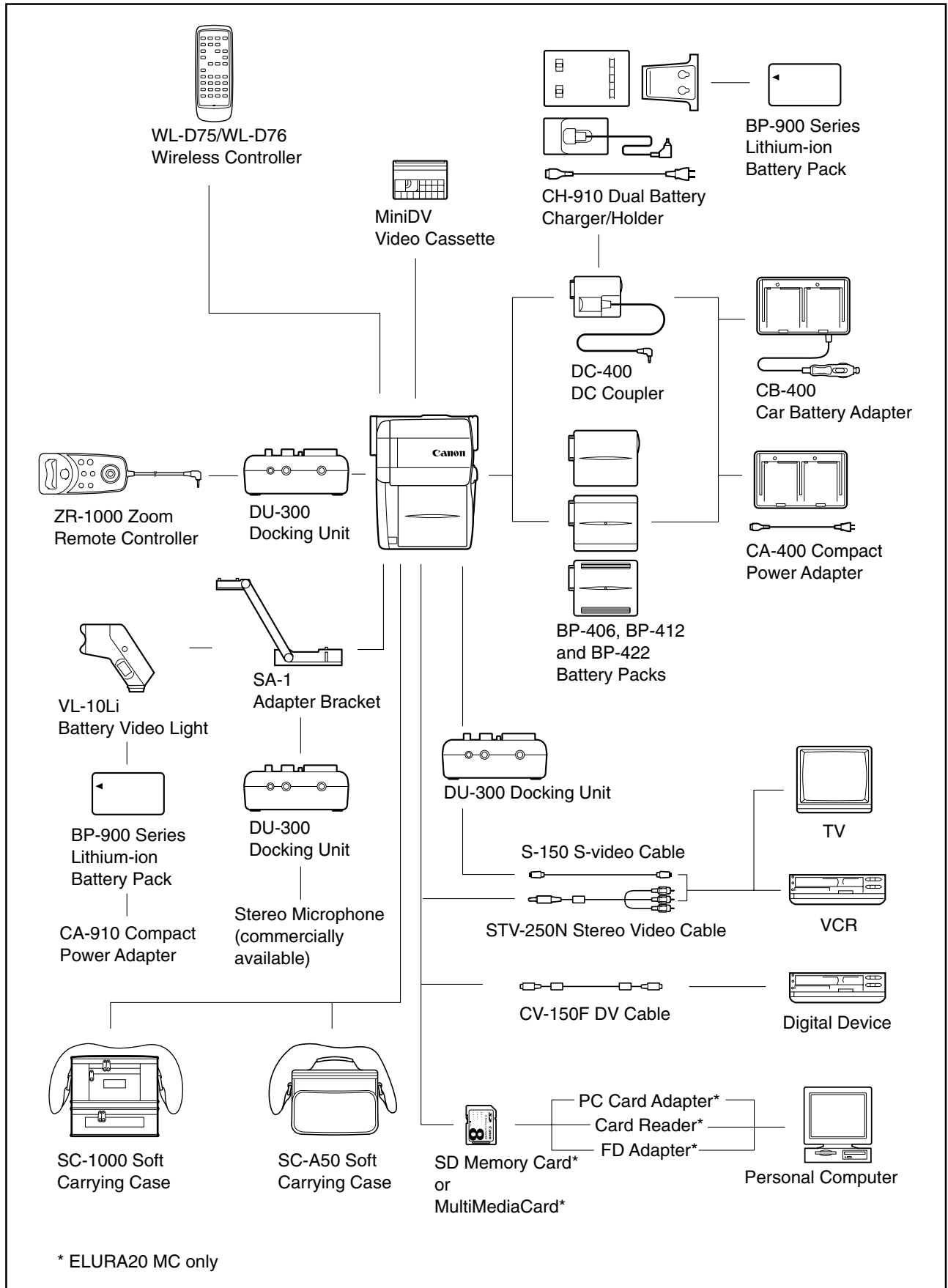


Fig. 1-2


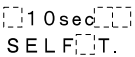
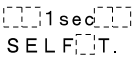















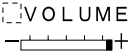
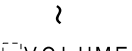

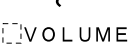


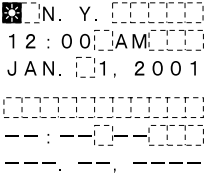


## 5. Viewfinder/ LCD Display Internal Display List

### 5-1 Camera Mode

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Camera mode		
Zoom display (appears for approx. 4 sec. after zoom operation)  Optical zoom 40× digital zoom Zoom stopped Zooming to Tele Zooming to Wide		
Hand jitter compensation display Hand jitter compensation ON Hand jitter compensation OFF	 No display	
Recording mode display SD mode     SP recording LP recording SDL mode   SP recording LP recording		
Operation mode display Recording Recording pause Cassette ejected Stopped + Rec search - Rec search		Mirror mode (LCD) 

MENU INDICATION	NORTH AMERICA MODEL	REMARKS																																																																																								
Program AE mode display Full auto mode Auto mode  Sports mode Portrait mode Spotlight mode Surf & snow mode Low-light mode	<div><div></div><div></div></div> <div>AUTO<div></div></div> <div>SPORTS<div></div></div> <div>PORTRAIT<div></div></div> <div>SPOTLIGHT</div> <div>SAND&amp;SNOW</div> <div>LOW<div></div>LIGHT</div>																																																																																									
Program AE mode menu	<table><tr><td></td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		0	1	2	3	4	5	6	7	8	9	0											1											2											3											4											5											6											
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EXP lock display Minimum exposure value  Standard exposure value  Maximum exposure value AE	<div><div></div><div></div></div> E. LOCK <div></div> - 1 1 <div>}</div> <div><div></div><div></div></div> E. LOCK <div></div> ± 0 <div></div> <div>}</div> <div><div></div><div></div></div> E. LOCK <div></div> + 1 1 No display																																																																																									
Timer display	<div><div></div><div></div></div> 0sec ~ 10sec																																																																																									
Remaining tape display      Tape end When indeterminate Tape warning display (blink) Other	<div><div></div><div></div></div> 2 2 5min <div>}</div> <div><div></div><div></div></div> 9 9min <div>}</div> <div><div></div><div></div></div> 5min <div>}</div> <div><div></div><div></div></div> 0min <div><div></div><div></div></div> END <div><div></div><div></div></div> -min <div><div></div><div></div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> 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MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Focus mode display AF off AF on	►M. FOCUS No display	
Selftimer display Timer standby Timer operating  Other	 SELF T.  SELF T. }  SELF T. No display	
Battery level   With power supply adapter mounted	     No display	Approx. 100% Approx. 75% Approx. 50% Approx. 25% Approx. 0% warning display (blink)
Shutter speed display 1/60 sec. 1/100 sec. 1/250 sec. 1/500 sec. 1/1000 sec. 1/2000 sec. Auto	1 / 6 0 1 / 1 0 0 1 / 2 5 0 1 / 5 0 0 1 / 1 0 0 0 1 / 2 0 0 0 No display	
Button type lithium battery low level warning display		
Remote control cord display When cord setting 1 is selected When cord setting 2 is selected Remote control receptor OFF	 1  2 	
White balance display When set Indoor preset Outdoor preset Auto	   No display	Blinks in WB setting or NG. Lights up continuously after WB setting.
Condensation warning display (blinks)		Blinks in red.

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Headphone volume adjustment display     Volume OFF	     	
Card mix display	CARD MIX	(MC model only)
Digital feature display When auto fade is selected When wipe is selected When scroll is selected When art is selected When black & white is selected When sepia is selected When mosaic is selected When multi-screen is selected When feature off is selected	FADE-T WIPE SCROLL ART BLK&WH SEPIA MOSAIC MULTI-S No display	
Window cut display Window cut ON Window cut OFF	No display WS OFF	External microphone connected.
Date/time display  When date and time are not set.		
Audio mode display When 16 bits is selected When 12 bits is selected	16 bit 12 bit	
16:9 mode display When the 16:9 mode is selected Other	16 : 9 No display	
Half-way press lock display AF/AE operation (blinks) AF/AE locked (light green)	 	
Focus mode display Normal recording Frame movie selected Photo mode selected	No display PRO. SCAN PHOTO	

## 5-2 VCR Mode

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
VCR Mode		
Audio output display When 12-bit stereo 1 is selected When 12-bit stereo 2 is selected When 12-bit mix 1:1 is selected 12-bit mix variable is selected 16-bit	STEREO 1 [ ] [ ] [ ] [ ] STEREO 2 [ ] [ ] [ ] [ ] MIX / FIXED [ ] [ ] MIX / VARI. [ ] [ ] No display	
Audio mix ratio display When ST-1:ST-2=1:0  When ST-1:ST-2=1:1  When ST-1:ST-2=0:1		
Record mode display SD mode      SP recording LP recording SDL mode    SP recording LP recording	[ ] [ ] SP [ ] [ ] LP [ ] [ ] SP [ ] [ ] LP	
Operation mode display Recording Pause When the cassette is ejected When stopped Play Fast forward Rewind No tape Fast forward play 2× speed play 1× speed play Forward slow play (Forward slow play)	[ ] [ ] REC [ ] [ ] PAUSE [ ] [ ] EJECT [ ] [ ] STOP [ ] [ ] ▶ [ ] [ ] [ ] [ ] FF ▶▶ [ ] [ ] ◀◀ REW [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] ▶▶ [ ] [ ] X 2 ▶▶ [ ] [ ] X 1 ▶▶ [ ] [ ] / 5 ▶▶ [ ] [ ] / 10 ▶▶	

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Forward frame play		
Forward still play		
Reverse still play		
Reverse frame play		
Reverse slow play		
(Reverse slow play)		
Reverse 1× speed play		
Reverse 2× speed play		
Rewind play		
Forward edit search		
Reverse edit search		
Forward date/photo search		
Reverse date/photo search		
FF return		
REW return		
AV insert pause		
AV insert record		
Audio dubbing pause		
Audio dubbing		
Tape counter		
Time code display	0 : 00 : 00 : 00 }	
	7 : 59 : 59 : 29	
When no setting	- : - - : - - : - -	
Zero set memory	Same as in Camera mode	
Remaining tape display	Same as in Camera mode.	
Audio dubbing/insert or search display		
When AV insert is selected		
When dubbing is selected		
Date search		
Freeze frame photo search		
Other than search	No display	
Battery level display	Same as in camera mode.	
Remote control display	Same as in camera mode.	
Battery warning display	Same as in camera mode.	
Condensation warning display	Same as in camera mode.	

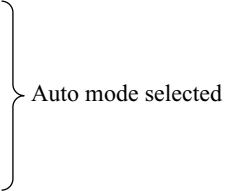
MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Speaker volume adjustment display	<div>SPEAKER</div> 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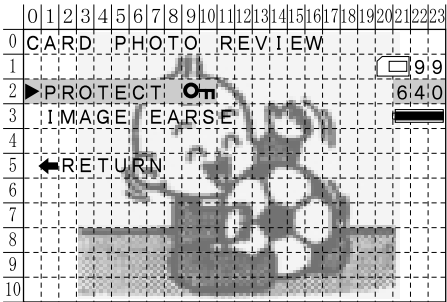




MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Day & time setting selected  When no setting	JAN. 1, 2001 ? DEC. 31, 2030 ---, --, ----	
Wind cut display	Same as in Camera mode.	
Audio data display When the audio dubbing/audio input terminal selected When the audio dubbing/microphone input terminal is selected	AUDIO IN  MIC. IN	
Audio mode display	Same as in Camera mode.	
16:9 mode	Same as in Camera mode.	
DV input DV input Other	DV IN No display	



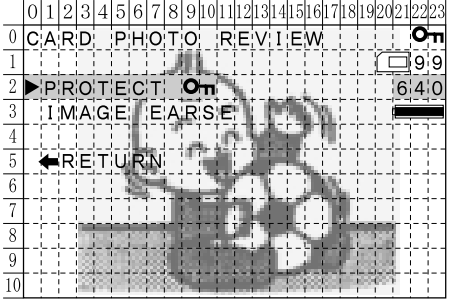
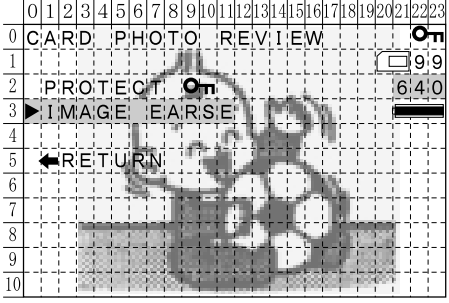
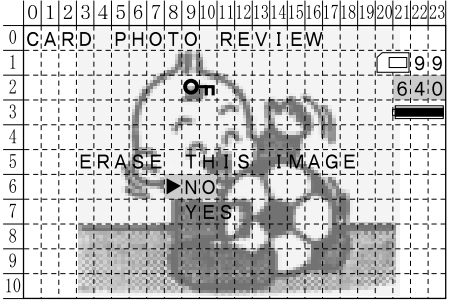


### 5-3 Card Recording Mode (MC Model Only)

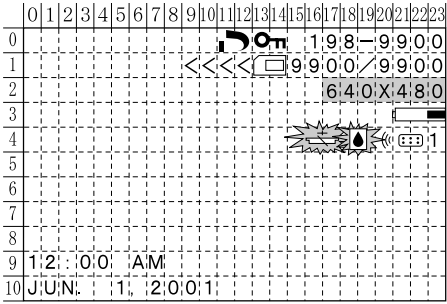


MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Card recording mode		
Zoom/exposure compensation display	Same as in Camera mode.	
Hand jitter compensation display	Same as in Camera mode.	
Card image quality display	FINE STD	
Program AE mode display	Same as in Camera mode.	
Card access display		
Card remaining capacity display	No card (blinks red) } frames is 9999 or more (green) 9999 } When the number of recordable frames is 99 (green) 99 } When the number of recordable frames is 5 (yellow) 5 } When the number of recordable frames is zero (0) (red) 0	
EXP lock display	Same as in Camera mode.	
Focus mode display	Same as in Camera mode.	
Selftimer display	Same as in Camera mode.	
Battery level display	Same as in Camera mode.	







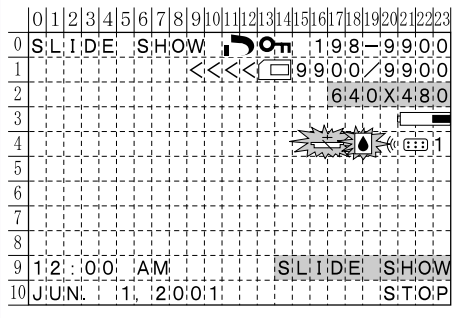
MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Shutter speed display	1 / 6 0 1 / 1 0 0 1 / 2 5 0 1 / 5 0 0 1 / 1 0 0 0 1 / 2 0 0 0	 Auto mode selected
Button type lithium battery low level warning display	Same as in Camera mode.	
Remote control code display	Same as in Camera mode.	
White balance display	Same as in Camera mode.	
Battery low level warning display	Same as in Camera mode.	
Condensation warning display	Same as in Camera mode.	
Date display	Same as in Camera mode. (Date & time only)	
Photo button partially pressed lock display	Same as in Camera mode.	

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Card review screen		
Card review mode display	CARD PHOTO REVIEW	
Card record image display	Same as the card record image display in Card record mode.	
Card access display Writing to card	<p>&gt;[ ]</p> <p>↓</p> <p>&gt;&gt;[ ]</p> <p>↓</p> <p>&gt;&gt;&gt;[ ]</p> <p>↓</p> <p>&gt;&gt;&gt;&gt;</p>	Red display, sequential display.
Reading from card	<p>[ ]&lt;</p> <p>↓</p> <p>[ ]&lt;&lt;</p> <p>↓</p> <p>[ ]&lt;&lt;&lt;</p> <p>↓</p> <p>&lt;&lt;&lt;&lt;</p>	Green display, sequential display.
Card remaining capacity display No card Checking card level No remaining capacity 99 frames remaining	<p></p> <p></p> <p></p> <p></p>	

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Image size display	6 4 0	Dot (horizontal)
Image protect 	Image protect set/cancel	
Image delete mode	Shift to image delete screen	
 Return	Exit card review mode	
Image protect set/cancel		
Image delete screen	 	

## 5-4 Card Play Mode (MC Model only)




MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Card Play Mode		
Print mark display		
Protect display		
DCF file name display Directory number 100, file number 0001  Directory number 998, file number 9900	1 0 0 - 0 0 0 1 λ 9 9 8 - 9 9 0 0	
Card access display Writing to card          Reading from card	>[ ] [ ] [ ] ↓ >>[ ] [ ] ↓ >>>[ ] ↓ >>>>  [ ] [ ] [ ] < ↓ [ ] [ ] << ↓ [ ] <<< ↓ <<<<	Red display Sequential display          Green display Sequential display

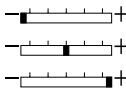

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Image number display		
No card		
Checking number of cards recorded	 --	
Zero (0) card recorded	 0 / 0	
	}	
9th of 99 cards recorded	 9 / 9 9	
	}	
99th of 99 cards recorded	 9 9 / 9 9	
	}	
9900th of 9900 cards recorded	 9 9 0 0 / 9 9 0 0	
Image size	6 4 0 X 4 8 0	Dot (Horizontal) × (Vertical)
Data display	Same as in VCR mode (Date & time only)	
Slide show		
Slide show operation guide display slide show in progress	SLIDE SHOW STOP	

## 5-5 Menu Displays

Menu displays include Camera mode, VCR mode, Card recording mode and Card play mode.

### Camera Mode

MAIN MENU ITEM	SUB-MENU ITEM	SETTING ITEM	DEFAULT	BACKUP
D. EFFECT	D. EFFECT	<b>OFF</b> FADER EFFECT MULTI-S	<b>OFF</b>	Lithium battery
	FADER	FADE-T WIPE SCROLL	FADE-T	Lithium battery
	EFFECT	ART BLK & WHT SEPIA MOSAIC	ART	Lithium battery
	M. S. SPEED	MANUAL FAST MODERATE SLOW	MODERATE	Lithium battery
	M. S. SPLIT	4 9 16	4	Lithium battery
	← RETURN			
CARD MIX	Shift the Card Mix Screen Displays			
CAMERA SET UP	SHUTTER	AUTO 1/60 1/100 1/250 1/500 1/1000 1/2000	AUTO	Lithium battery
	DIGITAL ZOOM	ON OFF	ON	Lithium battery
	IMAGE S. (⏮ ⏭)	ON OFF	ON	Lithium battery
	16:9	ON OFF	OFF	Lithium battery
	WHIT BAL	AUTO SET  INDOOR  OUTDOOR 	AUTO	Lithium battery
	← RETURN			
VCR SET UP	REC MODE	SP LP <b>E</b> SP <b>E</b> LP	SP	Lithium battery
	WIND SCREEN	ON OFF	ON	Lithium battery
	AUDIO MODE *2	16 bit 12 bit	12 bit	Lithium battery
	← RETURN			

MAIN MENU ITEM	SUB-MENU ITEM	SETTING ITEM	DEFAULT	BACKUP
DISP. SET TP	BRIGHTNESS *1			Lithium battery
	MIRROR *1	ON OFF	ON	Lithium battery
	TV SCREEN	ON OFF	ON	Lithium battery
	D/T DISPLAY *1	ON OFF	OFF	Lithium battery
	◀ RETURN			
SYSTEM	WL REMOTE *2	Ⓢ 1 Ⓢ 2 OFF Ⓢ	Ⓢ 1	Lithium battery
	TALLY LAMP *1	ON OFF	ON	Lithium battery
	BEEP *1	ON OFF	ON	Lithium battery
	T. ZONE/DST *2	LONDON LONDON * PARIS PARIS * ..... CAIRO MOSCOW DUBAI KARACHI DACCA BANGKOK H. KONG TOKYO SYDNEY SOLOMON WELLGTN SAMOA HONOLU. ANCHOR L.A. DENVER CHICAGO N.Y. CARACAS RIO FERNEN. ..... AZORES AZORES *	N.Y.	Lithium battery
	D/TIME SEL *2	JAN. 1,2001 12:00 AM } DEC.31,2001 11:59 PM	JAN. 1,2001 12:00 AM	Lithium battery
	◀ RETURN			
	◀ RETURN			


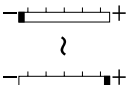
\*1 : TALLY LAMP, BEEP, BRIGHTNESS, MIRROR and D/T DISPLAY data are displayed on the Menu screen only.

\*2 : On other screens, they are displayed for 4 seconds after Power ON and Menu Exit.

D/TIME SEL is displayed only when D/T DISPLAY is OFF. WL REMOTE “OFF (Ⓢ)” is always displayed.



## VCR Mode




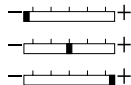

MAIN MENU ITEM	SUB-MENU ITEM	SETTING ITEM	DEFAULT	BACKUP
D. EFFECT	D. EFFECT	<b>OFF</b> EFFECT MULTI-S	<b>OFF</b>	Lithium battery
	FADER	FADE-T WIPE SCROLL MOSAIC	FADE-T	Lithium battery
	EFFECT	ART BLK & WHT SEPIA MOSAIC	ART	Lithium battery
	M. S. SPEED	MANUAL FAST MODERATE SLOW	MODERATE	Lithium battery
	M. S. SPLIT	4 9 16	4	Lithium battery
	← RETURN			
VCR SET UP	REC MODE	SP LP <b>E</b> SP <b>E</b> LP	SP	Lithium battery
	OUTPUT CH*1	L/R L/L R/R	L/R	Lithium battery
	AUDIO DUB	AUDIO IN MIC. IN	AUDIO IN	Lithium battery
	WIND SCREEN	ON OFF	ON	Lithium battery
	AUDIO MODE	16 bit 12 bit	12 bit	Lithium battery
	← RETURN			
CARD SET UP	QUALITY	FINE STANDARD	FINE	Lithium battery
	IMAGE NOS. *1	RESET CONTINUOUS	CONTINUOUS	Lithium battery
	SHTR SOUND	ON OFF	ON	Lithium battery
	← RETURN			
CARD OPER.	COPY  → 	CANCEL EXECUTE	CANCEL	----
	← RETURN			
DISP. SET UP	BRIGHTNESS *1			Lithium battery
	DISPLAY	ON OFF	ON	Lithium battery
	6 SEC. DATE *1	ON OFF	OFF	Lithium battery
	DATA CODE *2	DATE/TIME CAMERA DATA CAM & D/T	DATE/TIME	Lithium battery

MAIN MENU ITEM	SUB-MENU ITEM	SETTING ITEM	DEFAULT	BACKUP
DISP. SET UP	D/TIME SEL *2	DATE TIME DATE & TIME	DATE & TIME	Lithium battery
	← RETURN			
SYSTEM	WL. REMOTE	☺ ☺ 1 ☺ ☺ 2 OFF ☺ ☺	☺ ☺ 1	Lithium battery
	TALLY LAMP	ON OFF	ON	Lithium battery
	BEEP *1	ON OFF	ON	Lithium battery
	← REUTRN			
← RETURN				

\*1 : BRIGHTNESS, 6 SEC. DATE, OUTPUT CH and BEEP data are displayed on the Menu screen only.

\*2 : On other screens, DATA CODE is displayed only when it is turned on.

Camera Recording Mode (Card/Camera Mode) (MC model only)

MAIN MENU ITEM	SUB-MENU ITEM	SETTING ITEM	DEFAULT	BACKUP
D. EFFECTS	D. EFFECT	<b>OFF</b> EFFECT MULTI-S	<b>OFF</b>	Lithium battery
	EFFECT	ART BLK & WHT SEPIA MOSAIC	ART	Lithium battery
	M. S. SPEED	MANUAL FAST MODERATE SLOW	MODERATE	Lithium battery
	M. S. SPLIT	4 9 16	4	Lithium battery
	← RETURN			
CAM. SET UP	SHUTTER	AUTO 1/60 1/100 1/250 1/500 1/1000 1/2000	AUTO	Lithium battery
	D. ZOOM	ON OFF	OFF	Lithium battery
	IMAGE S. (⏮ ⏭)	ON OFF	ON	Lithium battery
	WHIT BAL	AUTO SET  INDOOR  OUTDOOR 	AUTO	Lithium battery
	← RETURN			
CARD SET UP	QUALITY	FINE STANDARD	FINE	Lithium battery
	FILE NOS. *1	RESET CONTINUOUS	CONTINUOUS	Lithium battery
	SHTR SOUND *1	ON OFF	ON	Lithium battery
	← RETURN			
DISP. SET UP	BRIGHTNESS *1			Lithium battery
	MIRROR *1	ON OFF	ON	Lithium battery
	TV SCREEN	ON OFF	ON	Lithium battery
	D/T DISPLAY *1	ON OFF	OFF	Lithium battery
	← RETURN			
SYSTEM	WL REMOTE *2	⏮ 1 ⏮ 2 OFF ⏮	⏮ 1	Lithium battery
	BEEP *1	ON OFF	ON	Lithium battery









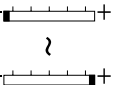





MAIN MENU ITEM	SUB-MENU ITEM	SETTING ITEM	DEFAULT	BACKUP
SYSTEM	T. ZONE/DST *2	LONDON LONDON * PARIS PARIS * ..... CAIRO MOSCOW DUBAI KARACHI DACCA BANGKOK H.KONG TOKYO SYDNEY SOLOMON WELLGTN SAMOA HONOLU. ANCHOR L.A. DENVER CHICAGO N.Y. CARACAS RIO FERNEN. ..... AZORES AZORES *	N.Y.	Lithium battery
	D/TIME SEL *2	JAN. 1, 2001 12:00 AM ? DEC.31,2001 11:59 PM	JAN. 1, 2001 12:00 AM	Lithium battery
	← RETURN			
← RETURN				

\*1 : BEEP, BRIGHTNESS, MIRROR, D/T DISPLAY, FILE NOS., and SHTR SOUND data are displayed on the Menu screen only.

\*2 : On other screens, they are displayed for 4 seconds after Power ON and Menu Exit.

D/TIME SEL is displayed only when D/T DISPLAY is OFF. WL REMOTE “OFF(Ⓢ)” is always displayed.

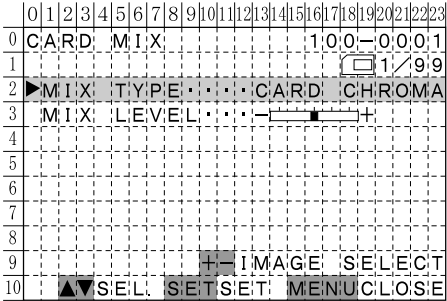
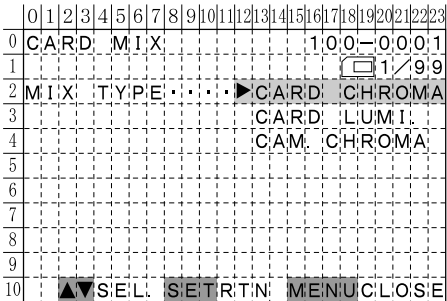
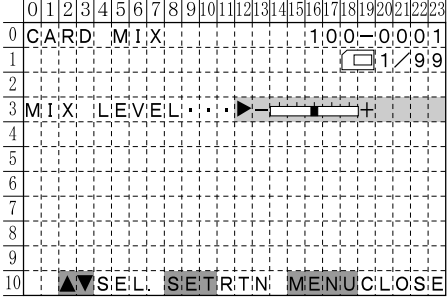
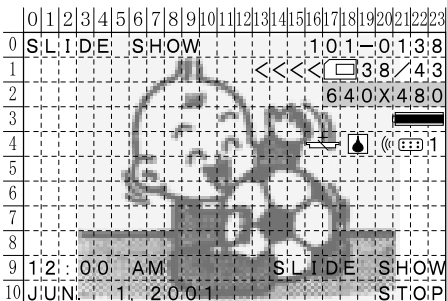
Card Play Mode (Card/VCR Modes) (MC Model Only)

MAIN MENU ITEM	SUB-MENU ITEM	SETTING ITEM	DEFAULT	BACKUP
CARD SET UP (SINGLE DISPLAY)	COPY  → 	CANCEL EXECUTE	CANCEL	----
	PRINT MARK 	Shift to Delete All Print Marks 		
	IMAGE ERASE	CANCEL SINGLE ALL	CANCEL	----
	FORMAT	CANCEL EXECUTE	CANCEL	----
	← RETURN			
CARD SET UP (INDEX DISPLAY)	→ PROTECT 	Shift to Image Protect Mode. 		
	→ PRINT MARK 	Shift to Print Mark Mode. 		
	← RETURN			
VCR SET UP	REC MODE	SP LP	SP	Lithium battery
	← RETURN			
DISP. SET UP	BRIGHTNESS *1			Lithium battery
	DISPLAY	ON OFF	ON	Lithium battery
	D/TIME SEL *2	DATE TIME DATE & TIME	DATE & TIME	Lithium battery
	← RETURN			
SYSTEM	WL REMOTE	Ⓢ  1 Ⓢ  2 OFF Ⓢ 	Ⓢ  1	Lithium battery
	TALLY LAMP	ON OFF	ON	Lithium battery
	BEEP *1	ON OFF	ON	Lithium battery
	← RETURN			
← RETURN				

\*1 : BRIGHTNESS, OUTPUT CH and BEEP data are displayed on the menu screen only.

\*2 : On other screens, DATA CODE is displayed only when it is turned on.

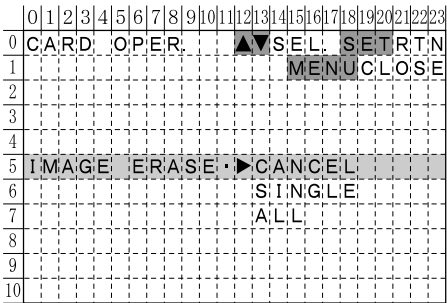
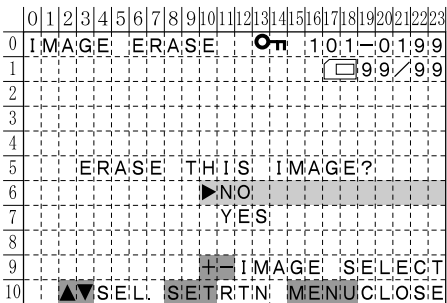
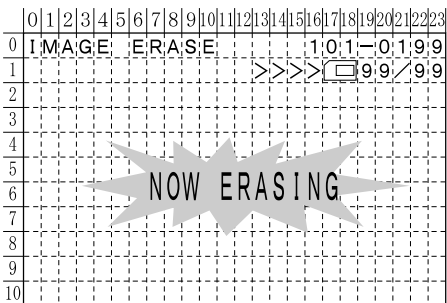
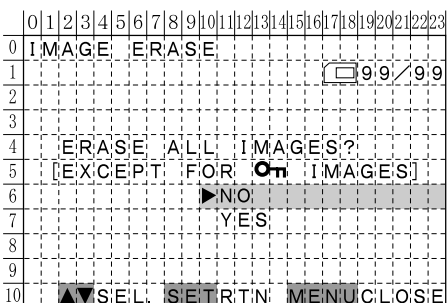
## 5-6 Card Mix Screen Displays

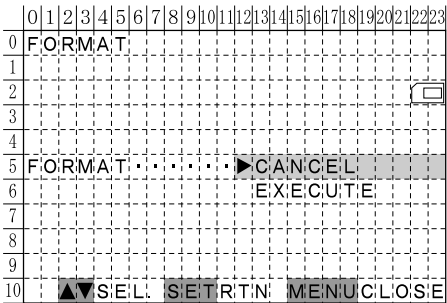
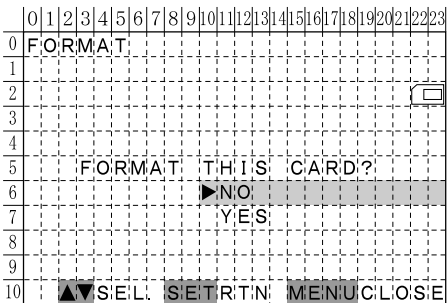
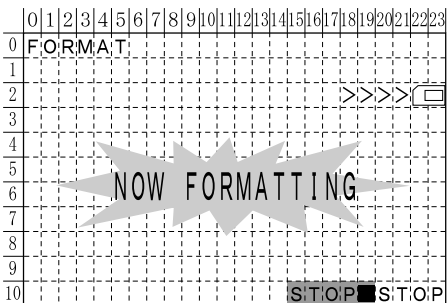
MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Card mix selection screen	 <p>The display shows a menu with 11 rows. Row 0: CARD MIX 1:0:0-0:0:0.1. Row 1: 1/9.9. Row 2: MIX TYPE... CARD CHROMA. Row 3: MIX LEVEL... with a slider bar. Row 4: 4. Row 5: 5. Row 6: 6. Row 7: 7. Row 8: 8. Row 9: + IMAGE SELECT. Row 10: SEL SET SET MENU CLOSE.</p>	
Mix key setting screen	 <p>The display shows a menu with 11 rows. Row 0: CARD MIX 1:0:0-0:0:0.1. Row 1: 1/9.9. Row 2: MIX TYPE... CARD CHROMA. Row 3: CARD LUMI. Row 4: CAM CHROMA. Row 5: 5. Row 6: 6. Row 7: 7. Row 8: 8. Row 9: 9. Row 10: SEL SET RTN MENU CLOSE.</p>	
Mix level setting screen	 <p>The display shows a menu with 11 rows. Row 0: CARD MIX 1:0:0-0:0:0.1. Row 1: 1/9.9. Row 2: 2. Row 3: MIX LEVEL... with a slider bar. Row 4: 4. Row 5: 5. Row 6: 6. Row 7: 7. Row 8: 8. Row 9: 9. Row 10: SEL SET RTN MENU CLOSE.</p>	
Slide show screen	 <p>The display shows a slide show of a baby's face. The top row shows SLIDE SHOW 1:0:1-0:1:3.8. The second row shows &lt;&lt;&lt;&lt; 3.8/4.3. The third row shows 6:4:0 X 4:8:0. The fourth row shows a battery level indicator and a speaker icon. The bottom row shows 1:2:0:0 AM SLIDE SHOW. The bottom right corner shows J.U.N. 1:2:0:0:1 STOP.</p>	

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Index screen		
Image protect screen		
Print mark screen		

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Copy screen		
Copy (□→□) selection screen	<div> <div>01234567891011121314151617181920212223</div> <div> <div>0100-0001SPPAUSE</div> <div>10123429</div> <div>29999/99996.0min</div> <div>3</div> <div>4COPY[□→□]▶CANCEL</div> <div>5EXECUTE</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10▲▼SEL. SETRTN MENU CLOSE</div> </div> </div>	
Copy (□→□) execute screen	<div> <div>01234567891011121314151617181920212223</div> <div> <div>0100-0001SPREC</div> <div>10123429</div> <div>2&lt;&lt;&lt;&lt;9999/99996.0min</div> <div>3</div> <div>4</div> <div>5NOW COPYING[□→□]</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10STOPSTOP</div> </div> </div>	
Copy (□→□) selection screen	<div> <div>01234567891011121314151617181920212223</div> <div> <div>0SPPAUSEFINE</div> <div>10123429</div> <div>26.0min9999</div> <div>3</div> <div>4COPY[□→□]▶CANCEL</div> <div>5EXECUTE</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10▲▼SEL. SETRTN MENU CLOSE</div> </div> </div>	
Copy (□→□) execute screen	<div> <div>01234567891011121314151617181920212223</div> <div> <div>0SPRECFINE</div> <div>10123429</div> <div>26.0min&gt;&gt;&gt;&gt;9999</div> <div>3</div> <div>4</div> <div>5NOW COPYING[□→□]</div> <div>6</div> <div>7</div> <div>8</div> <div>9</div> <div>10STOPSTOP</div> </div> </div>	



MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Image delete screen Image delete selection screen		
One image deletion		
Deletion in progress warning		
All images deletion		

MENU INDICATION	NORTH AMERICA MODEL	REMARKS
Format screen	 <p>The display shows a 12x24 grid. Row 0: '0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23'. Row 1: 'FORMAT'. Row 2: A cursor icon at column 22. Row 3: Empty. Row 4: Empty. Row 5: 'FORMAT.....▶CANCEL'. Row 6: 'EXECUTE'. Row 7: Empty. Row 8: Empty. Row 9: Empty. Row 10: '▲▼SEL SET RTN MENU CLOSE'.</p>	
Format confirmation screen	 <p>The display shows a 12x24 grid. Row 0: '0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23'. Row 1: 'FORMAT'. Row 2: A cursor icon at column 22. Row 3: Empty. Row 4: Empty. Row 5: 'FORMAT THIS CARD?'. Row 6: '▶NO'. Row 7: 'YES'. Row 8: Empty. Row 9: Empty. Row 10: '▲▼SEL SET RTN MENU CLOSE'.</p>	
Format execution screen	 <p>The display shows a 12x24 grid. Row 0: '0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23'. Row 1: 'FORMAT'. Row 2: '&gt;&gt;&gt;&gt;' and a cursor icon at column 22. Row 3: Empty. Row 4: Empty. Row 5: 'NOW FORMATTING' inside a starburst graphic. Row 6: Empty. Row 7: Empty. Row 8: Empty. Row 9: Empty. Row 10: 'STOP■STOP'.</p>	

## 5-7 Warning Display

### COPYRIGHT PROTECTED PLAYBACK IS RESTRICTED

- Displayed when a copyright protected tape is played back.

### COPYRIGHT PROTECTED DUBBING RESTRICTED

- Displayed when copyright data is detected during DV input. Also displayed when signals output from a TV set or vide are disrupted ruing analog line input.

### SET THE TIME ZONE, DATE AND TIME

- Displayed when the power is turned on when the time zone, date and time have not been set.

### REMOVE THE CASSETTE

- Displayed if a cassette is loaded when a mechanical error or condensation is detected.

### CHECK THE DV INPUT

- Displayed when REC is pressed in a mode in which recording is possible but either DV input is not connected or, if connected is not recognized for some reason.

### CHANGE THE BATTERY PACK

- Displayed when the battery is exhausted.

### CONDENSATION HAS BEEN DETECTED

- Displayed when condensation is detected (if cassette is loaded, this message will be followed by “REMOVE THE CASSETTE”).

### THE TAPE IS SET FOR ERASURE PREVENTION

- Displayed in the VCR mode when REC is pressed in a mode in which recording is possible but the cassette is set for erase protection.  
In the Camera mode, this message is displayed when the power is turned on, when the START/STOP button is pressed and when a cassette is loaded.

### TAPE END

- Displayed when a key [FF, PLAY, etc.] that forwards the tape is pressed at the tape end or in a mode that can forward the tape during detection.

### CHECK THE CASSETTE [REC MODE]

- Displayed when the Audio Dubbing or the AV insert button is pressed in a section recorded in LP/ESP/ELP, or when the LP/ESP/ELP modes are detected during audio dubbing or AV insert.

### CHECK THE CASSETTE [AUDIO MODE]

- Displayed when the Audio Dubbing button is pressed in a section with 16-bit or 4-ch simultaneous recording. Also displayed when the 16-bit/4-ch simultaneous recording mode is detected during audio dubbing.

### CHECK THE CASSETTE [BLANK]

- Displayed when an unrecorded section is detected during audio dubbing or AV insert.

## HEADS DIRTY, USE CLEANING CASSETTE

- Displayed when the head is clogged.

## CARD ERROR

- Displayed when recording is not possible because of a card error. (MC model only).

## CARD FULL

- Displayed when there is no available space on a card. (MC model only).

## NAMING ERROR

- Displayed when the file numbers or directory numbers have reached the maximum. (MC model only).

## UNIDENTIFIABLE IMAGE

- Displayed when an attempt is made to playback an image in a format that cannot be played back, a noncompatible JPEG image or an image with damaged data. (MC model only).

## PRINT MARK ERROR

- Displayed when there are too many (51 or more) print marks or the mark file cannot be edited. (MC model only).

## NO CARD

- Displayed when there is no card in the body socket. (MC model only).

## NO IMAGES

- Displayed when there are no images on a card to play back. (MC model only).

## THE CARD IS SET FOR ERASURE PREVENTION

- Displayed when an attempt is made to write to a SD card (VCR mode, card record mode) that is erase protected. (MC model only).

\*\* When a problem occurs, these warnings are displayed for approx. 4 sec. In the center of the screen.

\*\* The only operation possible while a warning is being displayed is to change the mode, which causes the warning to disappear.

## 6. Data Backup

### 6-1 Main Power Supply Backup

The condensation timer is backed up only by the main power supply.

### 6-2 Backup by the Main Power Supply or Backup Power Supply (Button Type Lithium Primary Battery)

Items other than the menu items backed up by the main power supply or backup power supply(button type lithium primary battery).

Item	Default	Remarks
Digital zoom position	Optical Tele	
WB date(SET)	- - - - -	
Date/time setting(auto date)	2001.1.1 12:00AM	
Menu cursor position	Uppermost position	
Time code	- - - - -	
Mix balance	Center	
Headphone volume	Center	
Speaker volume	Center	
Mechanical error	- - - - -	Reset by removing the main power supply

## 6-3 Backup Conditions Using Switch Operation

### 6-3-1 Turning OFF the Power Supply

When the camera mode is “Program AE”.

In the Full Auto mode ☐, turn on the camera power and then follow the procedure in 6-3-3 Setting the Full Auto mode.

Item	Power switch OFF/VCR
● Camera mode, Card record mode	
Program AE modes	Backup
Manual focus ON/OFF	Backup
EXP lock ON/OFF	Reset (to OFF)
DE, DF ON/OFF	Reset (to OFF)
Headphone volume *CAM	Backup
Selftimer ON/OFF	Reset (to OFF)
On-screen ON/OFF	Backup
Zero set memory counter value *CAM	Backup
● Camera, Card recording menu item setting	
Digital effect selection	Backup *Independent
Fader *CAM	Backup *Independent
Effect	Backup *independent
Multi-screen speed	Backup *Independent
Multi-screen number	Backup *Independent
Card mix key selection *CAM (MC model only)	Backup
Card mix level *CAM (MC model only)	Backup
Shutter speed setting	Backup
Digital zoom setting	Backup
Hand jitter compensation ON/OFF	Backup
16:9 ON/OFF *CAM	Backup
White balance setting	Backup
Remote control code setting	Backup
TALLY lamp *CAM	Backup
Record mode setting *CAM	Backup
Warning buzzer ON/OFF	Backup
Wind cut ON/OFF	Backup
Audio mode setting *CAM *SD	Backup
LCD Brightness adjustment	Backup
Mirror photo setting	Backup
On-screen ON/OFF	Backup
Day/time display	Backup
Time zone/daylight saving time setting	Backup
Date/time setting	Backup
Image quality *CD	Backup
Number reset *CD	Backup
Shutter sound *CD	Backup

\* CAM\* Camera mode only \*CD : Card Record mode only (MC model only)

\* Independent : The Card/camera mode, Camera mode and VCR mode are backed up independently.

\* SD : SP/LO mode only.

Still image selection for card mix recording (card mix standby) is not backed up when the power is turned OFF.

### 6-3-2 Other Power Switch Positions

Item	Power switch OFF
● VCR mode	
Headphone volume	Backup
Speaker volume	Backup
On-screen ON/OFF	Reset (to OFF)
Zero set memory counter value	Backup
Data code display ON/OFF	Reset (to OFF)
Audio 12-bit output selection	Reset (to stereo 1)
Mix balance setting	Backup
Search selection photo search/date search	Reset (to photo search)
● VCR menu item setting	
Digital effect selection	Backup *Independent
Fader *CAM	Backup Independent
Effect	Backup *Independent
Multi-screen speed	Backup *Independent
Multi-screen number	Backup *Independent
Remote control code setting	Backup
Record mode setting	Backup
Data code setting	Backup
Date/time select setting	Backup
LCD Brightness adjustment	Backup
Text display during playback ON/OFF	Backup
Auto date/time display ON/OFF	Backup
Bilingual setting	Reset (to main + sub)
Audio dubbing input setting	Backup
Wind cut ON/OFF	Backup
Line in audio mode setting	Backup
Warning buzzer ON/OFF	Backup
Image quality (MC model only)	Backup
Number reset (MC model only)	Backup
● Card play mode (MC model only)	
On-screen ON/OFF	Reset (to OFF)
Data code display ON/OFF	Reset (to OFF)
● Card play mode menu item setting (MC model only)	
Remote control code setting	Backup
Record mode setting	Backup
Data code setting	Backup
Date/time selection	Backup
LCD Brightness adjustment	Backup
Text display during playback	Backup
Date auto display	Backup
Warning buzzer	Backup

### 6-3-3 Switching the Camera Mode/Switching the Program AE Mode

When the ☐ / **P** switch is switched from **P** (Program AE) to ☐ (Full Auto), and when the ☐ / **P** switch is at ☐, the various items are backed up if switched to other program AE mode.

Item	<input type="checkbox"/> Full Auto	Switch the Program AE mode
● Camera mode, Card recording mode (MC model only)		
Program AE mode type	Reset (to Auto)	-----
Autofocus ON/OFF	Reset (to ON)	Backup
EXP lock ON/OFF	Reset (to OFF)	Reset (to OFF)
DE, DF ON/OFF	Reset (to OFF)	Backup
Headphone volume	Backup	Backup
Selftimer ON/OFF	Backup	Backup
On-screen ON/OFF	Backup	Backup
Zero set memory counter value *CAM	Backup	Backup
● Camera mode, Card recording mode (MC model only) menu item setting		
Digital effect selection	Backup *Independent	Backup *Independent
Fader *CAM	Backup *Independent	Backup *Independent
Effect	Backup *Independent	Backup *Independent
Multi-screen speed	Backup *Independent	Backup *Independent
Multi-screen number	Backup *Independent	Backup *Independent
Card mix selection *CAM (MC model only)	Backup	Backup
Card mix level *CAM (MC model only)	Backup	Backup
Card mix record image selection *CAM (MC model only) (card mix standby)	Reset	Backup
Shutter speed	Reset (to Auto)	Reset (to Auto)
Digital zoom ON/OFF	Backup	Backup
Hand jitter compensation	Reset (to ON)	Backup
16:9 *CAM	Reset (to OFF)	Backup
White balance	Reset (to Auto)	Backup
Remote control code	Backup	Backup
Tally lamp ON/OFF *CAM	Backup	Backup
Record mode *CAM	Backup	Backup
Warning buzzer	Backup	Backup
Wind cut	Backup	Backup
Audio mode *CAM	Backup	Backup
LCD Brightness adjustment	Backup	Backup
Mirror photo setting	Backup	Backup
On-screen ON/OFF	Backup	Backup
Day/time display	Backup	Backup
Time zone/daylight saving time	Backup	Backup
Date/time setting	Backup	Backup
Image quality *CD (MC model only)	Backup	Backup
Image size *CD (MC model only)	Backup	Backup
Number reset *CD (MC model only)	Backup	Backup
Shutter sound *CD (MC model only)	Backup	Backup

\* CAM \* Camera mode only \*CD : Card Record mode only (MC model only)

\* Independent: The Card/camera mode, Camera mode and VCR mode are backed up independently.

- Card mix recording of still image selection(card mix standby)is not backed up in either normal or progressive.
- Backup for timer power OFF for a 5-minute record pause and for LANC power OFF is the same as for when the power switch is turned OFF.



## 7. Others

### 7-1 Green Mode

#### Green Mode Default Status








- Focus----- Auto
- Exposure ----- Auto
- White balance ----- Auto
- DE, DF ----- OFF
- Hand jitter compensation ----- ON
- Shutter ----- Auto
- 16:9 ----- OFF

Other than the above, all statuses will remain the same even at the Green mode position.

#### Keys that are Ineffective in the Green Mode.

- Focus (Auto/Manual) button (compulsory Auto)
- Exposure (Auto/Lock) button (compulsory Auto)
- Multi-dial
- Digital effect (ON/OFF) button (compulsory OFF)

#### Relationship between the Program AE Mode and the Various Photo Functions

Item							
Autofocus ON/OFF	Compulsory ON	●	●	●	●	●	●
Shutter speed setting	×	●	×	×	×	×	×
AE lock	×	●	●	●	×	×	●
Hand jitter compensation ON/OFF	Compulsory ON	●	●	●	●	●	●
White balance setting	Compulsory Auto	●	●	●	●	●	●
Wind cut ON/OFF	●	●	●	●	●	●	●
Digital zoom ON/OFF	●	●	●	●	●	●	●
16:9 ON/OFF	Compulsory OFF	●	●	●	●	●	●
Digital fader ON/OFF	×	●	●	●	●	●	●
Digital effect ON/OFF	×	●	●	●	●	●	●
Multi-screen	×	●	●	●	●	●	●
Photo recording (tape recording)	●	●	●	●	●	●	●
Progressive photo recording	●	●	●	●	●	●	●
Card mix (MC model only)	×	●	●	●	●	●	●

### 7-2 On-Screen

- On-screen can be turned on and OFF using LANC, infrared remote control or the menu.
- Text on line out will be white during on-screen (LCD panel and CVF text will be in color).
- The display defaults are ON in the Camera mode and OFF in the VCR mode.

### 7-3 Headphone (with Docking Unit DU-300 Connected), Speaker

- The speaker is OFF in the Camera mode.
- The speaker is ON during normal VCR mode playback and the volume can be adjusted with the Multi-dial.
- Headphone volume can be adjusted with the Multi-dial only when Headphone has been mounted.
- The speaker is turned OFF when Headphone is selected from the menu.

## 7-4 Battery Level display, Warning Displays and (Low-Power) Power Shutoff

### Battery Level Display

- When a battery is used, the 5-step battery level display before the low power warning is displayed (100%, 75%, 50%, 25%, 0% (approx.)) will be reset when the power is turned OFF. In other words, if the voltage is restored while the power is OFF, the battery level display will show an increase when the power is again turned ON. Once the low-power display has appeared, however, the low-power warning will not be reset, even if the voltage is restored.
- When the AC adapter is used, there is no battery level display. If the voltage should drop drastically below the warning level warning, however, the battery level warning will appear. Also, the battery level warning will turn OFF when the battery voltage rises above the power-OFF warning level.

## 7-5 System Data Display

	Camera mode		VCR mode		
	Camera screen	Rec search	DIF input	Blue background	PB (special playback)
Data code (date/time)	× LANC appears	× LANC appears	× - - -	~ - - -	●
Data code (camera data)	×	×	× F - - -, etc.	× F - - -, etc.	●
Time code	●	●	● Body	●	●
Audio mode (12/16 bit)	● 4-sec. display	×	● DIF	×	●
Wide/normal	● Setting display	×	● DIF	×	●
CGMS (warning)	~	●	● DIF	×	●
SP/LP	● Setting display	●	● Setting display	● Setting display	●

\* The time code display is “-: -: -:” for unrecorded sections and when there is no tape.

\* CGMS: not output to LINE OUT and CVF (panel) when copying is prohibited.

## 7-6 Data Code display

Data code can be used to turn displays ON and OFF independently (without regard to other on-screen text displays.)

## 7-7 MP Tape Capability

LP as well as ESP and ELP recording is not possible with MP tape. Even if LP, ESP or ELP is selected from menu, the SP mode will always be set when a tape is loaded. LP playback is possible with tapes recorded in the LP mode.

## 7-8 Warning Buzzer

The warning buzzer will sound melodically in the following cases.

Mode	Tone color
Power on	Peep
When a cassette tape whose erase protection knob is set to Save is loaded (Camera mode)	Peep, peep, peep
When the EJECT cover is left open (including power off)	Peep, peep
When recording starts (Camera mode)	Peep
During REC PAUSE (Camera mode)	Peep, peep
Photo button partially pressed OK	Peep, peep
Photo REC start	Peep
When condensation is detected, when a camera error occurs, and 5 sec. before the REC PAUSE (*) 5-min. timer ends	Beep × 5
When the Setting button is operated while menu selection is not possible	Boop
20 sec., 15 sec., and 10 sec. before the REC PAUSE (*) 5-min. timer ends	Beep, beep, beep
Seiftimer (syncs with tally blinking)	Peep, peep, 1-sec. interval × 8 Peep, 0.25-sec. interval × 8

REC PAUSE (\*) includes audio dubbing and AV insert REC PAUSE.

\* Peep = 4KHz; beep = 2KHz; boop 1KHz

## 7-9 Using Analog Line, DV Recording

- (1) Set the power switch to [VCR].

The Power LED (green) will light and, if a cassette is loaded, standby status will be activated. The jack (DVAS-video, AV mini) status will be output, and headphone jack (with Docking Unit DU-300 connected) and speaker will be output (higher priority in headphone).

- (2) Connect a cable from a recording source to the S-video jack\* (video signal) and AV mini jack (audio signal), or to the AV mini jack (video and audio signals), or to the DV jack; then turn on the recording source power supply.

If the recording source is connected to multiple jacks at the same time, the recording source is automatically selected in following jack priority.

DV Jack > S-video Jack \* > AV Jack \* : (with Docking Unit DU-300 connected)

During playback (including special play), the playback image will have a higher priority.

- (3) On the remote control, press [REC STANDBY].

Recording pause status will be activated. In the case of analog line input, the S-video jack and AV mini jack will switch to input.

- (4) To start recording, press [▶ / ||] of the remote controller.

Recording of the video and audio from the jack selected in item (2) will start.

([▶ / ||] toggles the record and record pause operations.)

- (5) Press [■] to stop recording.

Recording will stop.

The Table below Shows the Input and Output Status for Each Mode.

	DV input signal present			No DV input signal present		
	LCD/CVF	DV jack	S/AV jack	LCD/CVF	DV jack	S/AV jack
Playback (including special playback)	Playback screen	OUT	OUT	Playback screen	OUT	OUT
No tape, STOP, FF, REW	DV input screen	IN	OUT	Blue background	OUT	OUT
REC PAUSE/PEG	DV input screen	IN	OUT	Line input screen *	IN	IN

\* There is no signal when there is no line input.

## 7-10 Video ID1 Detection/Output Capability

- (1) S1 signal output

When 16:9 images are output from the S-video jack in the Full (Squeeze) mode compressed to 4:3, an identification signal is output to automatically return them to 16:9 images for wide monitors with S1 capability (when tape on which is recorded system data related to the camera 16:9 mode or aspect ratio is played back.)

• NTSC → 16:9 full mode + 4:3 letterbox mode identification signal output

- (2) Video ID1 output

When 16:9 images are output from the composite video jack in the Full (Squeeze) mode compressed to 4:3, an identification signal is output to automatically return them to 16:9 images for wide monitors with Video ID1 capability (when tape on which is recorded system data related to the camera 16:9 mode or aspect ratio is played back.)

- (3) S1 signal and video ID1 detection with line input

When video ID1 and S1 signals superimposed over video signals from the composite video jack or S-video jack are detected, the system data related to aspect ratio is recorded.

## 7-11 Closed Caption Detection/Output

- (1) Closed caption signal output
  - When tape on which closed caption data are recorded is played back, the closed caption data is output superimposed over the video signal.
  - The caption data can be displayed on the screen if the monitor has a built-in closed caption decoder.
- (2) Closed caption signal detection
  - During analog or digital line input recording, the closed caption data in the input signal is detected and the closed caption data is then recorded.

## 7-12 Audio Dubbing

### 7-12-1 Tape Usable for Audio Dubbing

Only tapes with 12-bit SP recording other than for dubbing 4-channel simultaneous recordings can be used. If an attempt is made to use any other tape, the Stop mode will be activated.






If the LP mode, 16-bit mode, 4-ch simultaneous recordings, unrecorded or SDL (SP / LP mode) recordings are detected → Stop (warning display).

### 7-12-2 Selecting an Audio Dubbing Signal Input Source

The audio dubbing input source is selected from the VCR menu.

Either of two items can be selected: Line (AV mini jack) or Mic. When Mic is selected, input will be from the external microphone if one is connected; otherwise, input will be from the built-in microphone.

### 7-12-3 Audio Dubbing Operation

- (1) In the VCR mode, position and pause the tape to be dubbed, then press the dubbing key of the remote control.  
The dubbing mode will be activated (dubbing pause) and  (dubbing pause) will appear on the LCD panel (CVF).
- (2) Press the Pause  key and input sound into the microphone.  
Dubbing will start.
- (3) Press the stop  key to stop.  
The dubbing mode will be canceled, the dubbing display will disappear and operation will stop.
  - If the pause  key is pressed instead of the stop  key, the dubbing mode will not be canceled and status (1) (dubbing pause) will return.
  - Dubbing can also be canceled by pressing the dubbing key during dubbing pause.
  - Also, if the Zero Set Memory key of the remote control is pressed at the tape position where dubbing is to be ended, operation will automatically stop and dubbing will be canceled when that position is reached after operation (2).

## 7-13 AV Insert

In the AV insert mode, the audio, video and sub-code areas are overwritten, but not the ITI (Insert and Track Information) area.

### 7-13-1 Tape Usable for AV Insert

Only tape recorded in the SP mode can be used for AV insert. If an attempt is made to use any other tape, the Stop mode will be activated.

If the LP mode, an unrecorded section or SDL mode is detected, operation will also stop (warning display).

### 7-13-2 AV Insert Operation

- (1) In the VCR mode, position and pause the tape to be used for AV insert, then press the AV Insert key of the remote control.  
The AV Insert mode will be activated (AV Insert Pause) and ● (AV Insert Pause) will appear on the LCD panel (CVF).
  - (2) Press the Pause || key and input the video and audio.  
AV insert will start. ● (AV Insert) will appear on the LCD panel (CVF).
  - (3) Press the Stop [■] key to stop.  
The AV Insert mode will be canceled, the AV Insert display will disappear and operation will stop.
    - If the Pause [■] key is pressed instead of the Stop || key, the AV Insert mode will not be canceled and status (1) (AV Insert pause) will return.
- \* AV Insert can also be canceled by pressing the AV Insert key of the remote control during AV Insert Pause.
- \* Also, if the Zero Set Memory key of the remote control is pressed at the tape position where AV insert is to be ended, operation will automatically stop and AV insert will be canceled when that position is reached after operation (2).

## 7-14 Multi-Dial

VCR operation and various settings are performed in accordance with the body mode.

### Dial Rotation

Body mode		Operational function	Rotating the dial upward
Using the menu		Item selection	The cursor moves upward
Menu	LCD Brightness adjustment	Brightness adjustment	The LCD screen becomes brighter
	Card mix level adjustment	Mix level adjustment	The mix level range narrows
EXP lock		EXP compensation	The aperture opens
Manual focus		Focus adjustment	Focus shifts to close-up
VCR mode :		Speaker volume adjustment	The volume increases

### Pushing the Dial

Body mode		Operational function	Dial push
Photo pause		Program AE, AE menu open/close (selection confirmation)	Program AE mode selection
Digital effect		Digital effect mode selection switch	Digital effect mode is selected.
Menu		Menu setting item switch	An item is selected.



## 7-15 LCD Panel/CVF (Color ViewFinder)

LCD panel and CVF power supply status

### 7-15-1 Camera Mode/Camera Recording Mode

LCD panel layout	LCD panel power supply	CVF power supply
Stored (panel surface side of body)	OFF	ON
Stored (outside panel surface)	ON Mirror mode aborted	OFF
Open	ON	OFF
Mirror photo status	ON	ON

\* : Panel display is restricted (but CVF and on-screen displays are normal) in the Mirror mode. Only the following codes are displayed in the upper left corner.

- Camera mode: only Recording ●. Recording pause ||●, Inject display ▲
- Card recording mode: No card , Card & access indicator  <<<<

(The Mirror mode is temporarily canceled during record search and various menu settings.)



### 7-15-2 VCR Mode/Card Play Mode

LCD panel layout	LCD panel power supply	CVF power supply
Stored (panel surface side of body)	OFF	ON
Stored (outside panel surface)	ON	OFF
Open	ON	OFF
Mirror photo status	ON	OFF

## 7-16 Memory Card System

### 7-16-1 Card Recording (Card Recording of Still Images)

#### a. Still Recording of Camera Images

- (1) Set the Power switch to Cameran, and set the Photo mode switch to  or **[P]**.  
The Power lamp will light (red) and recording status will be activated if a card has been loaded.
- (2) Frame the subject in the center of the screen from the desired angle, then partially press the [Photo] key.  
“○” will blink white, focus and AE will be locked and, when the operation of the hand jitter compensation function has been restricted, “○” will light green.
- (3) Frame the subject and fully press the [Photo] key. “○” will go out and the image will be recorded on the card at the instant the key is fully pressed. During the card recording, the red access display (“>>>>”) will blink (> → >> → >>> → >>>> → > •••) toward the “Card mark ”. During this time, the image being recorded will stop (freeze) on the LCP panel (or CVF) so the result can be checked. (In the mirror photo mode, “>>>>” will blink white toward the Card mark.)

#### b. Card Recording of VCR Images During Playback

- (1) Tape is played back using normal playback. If the [Photo] button is partially pressed during tape playback, the card data will appear on the screen and, at the same time, Play Pause will be activated. If the [Photo] button is now fully pressed, the still image will be recorded on the card. The above operation can also be performed during Play Pause.





### c. Card Recording of DV Input Images

- (1) Set the Power switch to [VCR]. The Power lamp (green) will light and, if a cassette is loaded, standby status will be activated.
- (2) Connect a cable from the recording source to the DV jack and turn on the source power supply.
- (3) If the [Photo] button is pressed when there is no tape or the tape is in stop status, the card data will appear on the screen and, at the same time, DV input will stop. If the [Photo] button is now fully pressed, the still image will be recorded on the card.

\* When an image recorded in the 16:9 mode is recorded on a card, it will be recorded on the card in vertical format.



\* Card recording of still image is not possible during analog line input (S-video jack, AV jack)

### 7-16-2 Copying [ → ] / [ → ]

Still image (Photo record) scenes recorded on tape are automatically searched and recorded sequentially on a card (VCR mode copy [  →  ]). Still images recorded on a card can also be photo recorded sequentially as still images on tape (card play mode copy [  →  ]).



#### a. Copy( → )

Still image (Photo record) scenes recorded on tape are automatically searched and recorded sequentially on a card.

- (1) Set the Power switch to [VCR].
- (2) Use [FF] and [REW] keys to locate the desired start position on the tape. Move the current tape position forward of the still image (Photo record) to be copied.
- (3) Use the [Menu] key to open the menu, select the “Card Execute” and “Card Execute” sub menu “Copy [  →  ]” and then press the [Settings] key. Cancel/Execute will appear. To abort copying, select Cancel and press the [Settings] key. To execute the copy, select “Execute” and press the [Settings] key.
- (4) When Execute has been selected and set, the Copy Execute screen (tape data is displayed in the upper left corner and card data is displayed in the lower right corner) will open and the copy operation will start.  
During the copy operation, a still image search of the tape will be performed starting from the current tape position. The still images discovered during the search are recorded as still images on the card. This operation will repeat until the end of the tape is reached or the card becomes full. The copy operation can be halted at any time by pressing the Stop key [■].

#### b. Copy ( → )

Still image scenes recorded on card are automatically recorded in sequence as still images on tape.

- (1) Set the Power switch to [Card play] mode.
- (2) Use the [+] and [-] keys to display the desired image (the image where copying is to start). When copying from a card to tape, copying will proceed sequentially from the currently displayed image to the last image.
- (3) Use the [Menu] key to open the menu, select the “Card Execute menu” and press the [Settings] key.  
From the “Card Execute” menu, select “Copy [  →  ]” and then press the [Settings] key to open the Copy Execute screen, where “Cancel/Execute” will appear. To abort copying, select “Cancel” and press the [Settings] key. To execute the copy, select “Execute” and press the [Settings] key.
- (4) When Execute has been selected and set, the Copy Execute screen (card data is displayed in the upper left corner and tape data is displayed in the lower right corner) will open and the copy operation will start. During the copy operation, the currently displayed still image search will be photo copied to the tape and then the next image will be displayed. This operation will repeat sequentially until the last image has been copied or the end of the tape has been reached. The copy operation can be halted at any time by pressing the Stop key [■].

### 7-16-3 Card Mix

- (1) Set the Power switch to “Movie” and set the Photo mode switch to **[P]**.  
The Power lamp (red) will light and, if a cassette is loaded, recording pause status will be activated.
  - (2) Press the [Menu] key and select “➡ Card Mix” from the main menu.
  - (3) The Card Mix sub-menu will open and the still image to be recorded on the card will appear instantaneously.  
Next, the card image and camera image will be mixed. The mix type, mix level and mix images can now be checked. If the [Menu] key is not pressed at this time to close the menu, it will not be possible to enter card mix standby status (standby status cannot be entered unless an image has been recorded and can be played back).  
When the Card [+] and [-] keys are pressed, the card still images will appear.  
When Mix Type is selected and the [Settings] key is pressed, three setting items will appear: “Card chroma key”, “Card luminance key” and “Camera chroma key”. Select the desired mix method from among these three.  
Also, when “Mix Level” is selected and the [Settings] key is pressed, the slide bar [ ———+ ] will appear for setting the mix level. When the desired mix level has been set, press the [Settings] key to establish the setting.
  - (4) When the [Menu] key is pressed to close the menu, the Card Mix Standby status will be activated.
  - (5) When the [Start/Stop] button is pressed, card mix moving images will be recorded to the cassette tape.  
When the [Photo] button is pressed, card mix still images will be recorded on the cassette tape.
- \* Even if the above card mix settings have been made, the image selection settings and standby status will be canceled by the following operations; therefore, it will be necessary to make the Image settings again.
- When the Power switch has been set to another mode.
  - When the Photo Mode switch has been set to Green mode.


### 7-16-4 Card Playback

#### a. Normal Playback/Slide Show

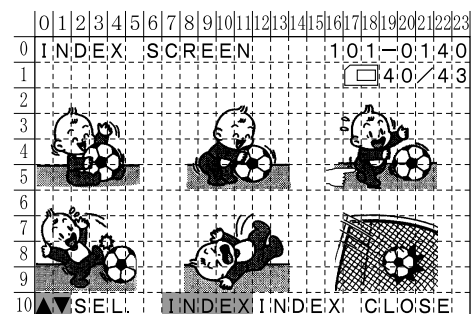
- (1) Set the Power switch to [Card play] mode. The Power lamp will light (green) and, if a card has been loaded and if there are images, the last image will be displayed. If no images have been recorded, a blue background will be displayed and the warning “No images” will be displayed for about 4 sec.  
The Card [+] and [-] keys can be used to display the previous and next images. When the [+] key is pressed at the last image, the first image will be displayed. When the [-] key is pressed at the first image, the last image will be displayed.
  - (2) When the [Slide Show] button is pressed a slide show will start from the currently displayed image. Each of the image will be displayed for approx. 5 sec. and then the next image will appear. The slide show can be canceled by again pressing the [Slide Show] button.  
The [Slide Show] key is toggled on starting and ending the slide show operation.
- \* The last image is the image with the largest directory number and the highest image number. The first image is the image with the smallest directory number and the smallest image number.

#### b. Index Screen

Six images can be displayed on one screen, making it easy to search images.

- (1) Press the [Index] key to change to the Index screen. Press again to return to the previous playback mode.  
From the Index screen, the Multi-dial is used to select images (the  mark will appear on the left side of the image).
- (2) The images on the screen can be selected sequentially by operating the Multi-dial. If the Multi-dial is again operated after the last (or first) image on the screen has been selected, the top (or the last) screen will be displayed automatically.



Screens showing 6 images each can be selected by operating the Card [+] and [-] keys. Only one selected image can be displayed normally by pressing the [Index] key.







### 7-16-5 Image Protecting Setting

It is possible to protect (erase protection) important images so they cannot be erased even if an attempt is made by mistake.

- (1) Press the [Index] key to open the Index screen, and press the [Menu] key to open the Menu screen.
- (2) From the “Card Execute” menu, select the “➔ Image Protect ” and press the [Settings] key to display the “Image Protect” screen (one screen displays 6 images). The Multi-dial can be used to select images from the “Image Protect” screen in the same way as for the Index screen described above. After the images have been selected, protection for the selected images can be toggled “ON/OFF” by pressing the [Settings] key. The protect mark () will be appended to identify the protected images.

### 7-16-6 Print Mark Setting

The print mark (DPOF mark) is a function that can be used to automatically select images for printing with a printer or by a lab.

- (1) Select the “Card Execute” menu in the same way as in item (1) in image protection setting described above.
- (2) From the “Card Execute” menu, select the “➔ Print Mark ” and press the [Settings] key to display the “Print Mark” screen (one screen displays 6 images). The Multi-dial can be used to select images from the “Print Mark” screen in the same way as for the Index screen described above. After the images have been selected, the print mark for the selected images can be toggled “ON/OFF” by pressing the [Settings] key. The protect mark () will be appended to identify the protected images.


\* Print marks can be appended to a maximum of 50 images. If an attempt is made to append the print mark to the 51st image, a print mark error will occur and setting will not be possible.

### 7-16-7 Image Erase

The following method can be used to erase unwanted images.

There are two image erase methods. One method is used after card recording has ended. In the other method, only images selected by using card review are erased while a card is still being used.

#### Image Erasure after Card Recording has Ended

- (1) Set the Power switch to [Card play] mode. When the still images are displayed, press the [Menu] key to open the “Card play” menu screen and select the “Card Execute” sub-menu.
- (2) On the “Card Execute” sub-menu, select “Image Erase”.
- (3) When “Image Erase” is selected, “Cancel/Erase One Image/Erase All” will appear. Select the desired item and then press the [Settings] key.
  - a) To abort image erase, select “Cancel” and press the [Settings] key.
  - b) To erase individual images after confirmation, select “Erase One Image” and then press the [Settings] key. When Erase One Image is selected and set, the screen will change and the message “Erase This Image?” plus a “Yes” / “No” box will appear. To erase the displayed image, select “Yes” and then press the [Settings] key.  
To erase a different image, use the Card [+] and [-] keys to display the image to be erased, select Yes and then press the [Settings] key to execute the erasure. To end erasing, select No and then press the [Settings] key. The menu in upper hierarchy will return. In the case of protected images, the Protect Mark () will be displayed at the top center of the screen, “Yes” will be displayed in purple and setting will be disabled. In order to erase a protected image, it is necessary to first return to the “Protect Setting screen” described above
  - c) To erase all of the images, select “Erase All” and then press the [Settings] key and then press the Settings key. When Erase All is selected and set, the screen will change and the message “Erase All Images?” plus a “Yes” / “No” box will appear. To erase all of the displayed images, select Yes and then press the [Settings] key. To abort erasing, select No and then press the [Settings] key.

Even if an attempt is made to erase all images, protected images will not be erased.

### 7-16-8 Format



Format is executed for new cards, when the “Card Error” warning appears, and when all of the images and files on a card are to be erased. Use the following method to execute Format.

- (1) Select the “Card Execute” menu in the same way as in item (1) in image protection setting described above.
- (2) From the “Card Execute” menu, select "Format" and then press the [Settings] key.
- (3) “Cancel/Execute” box will appear. To execute formatting, select “Execute” and press the [Settings] key. To cancel formatting, select the “Cancel” key and then press the [Settings] key.
- (4) When Execute has been selected and executed, the message “Format This Card?” will appear together with a “Yes/No” box. To continue with formatting, select “Yes” and then press the [Settings] key. To cancel formatting, select “Cancel” key and press the [Settings] key.

\* Use caution because the following images and files will be erased by formatting.

- Protected images
- Previously recorded card mix sample images
- Images and files from other equipment or PC

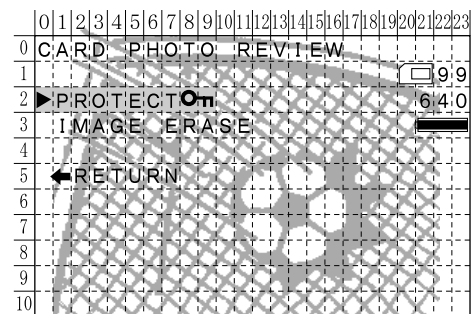
### 7-16-9 Card Review

When [– / ] key is pressed on the Card recording mode, the “Card still image check” display will appear and the mode will be changed to the Card Still Image Check mode. For the still images read out, the “Image Protect ” or “Delete One Image” operation is available.

To cancel the mode, select “Return” with the multi-dial.

The mode will return to ordinary mode after images are deleted.

- \* If the card contains no image or the card is an SD memory card protected, you can not move to the Card review mode.



### 7-16-10 Image Setting



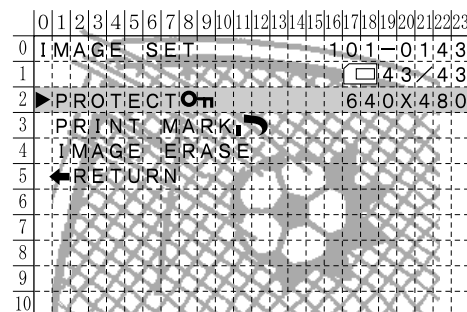
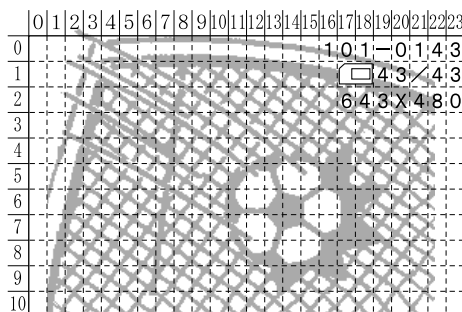
If the multi-dial is pressed during card (single) playback, the mode will be changed to the Image setting mode and the “Image Setting” display will appear. For the still images read out, the “Image Protect ”, “Print Mark  Setting”, or “Delete One Image” operation is available.

Image settings can be canceled by selecting “Return” on the multi-dial.

- \* If the card contains no image, you can not move to the Image setting mode.
- \* In the case of an SE memory card protected, the mode can be changed to the Image setting mode, but the operation menu items above are displayed in purple and disabled.

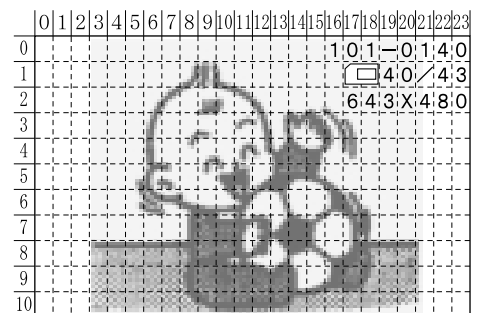
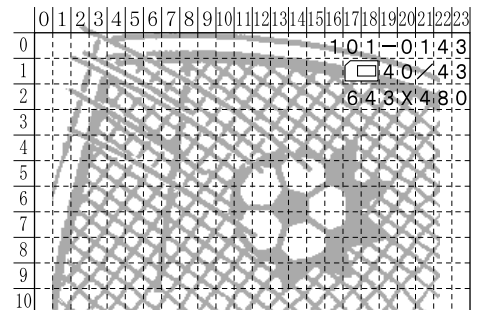
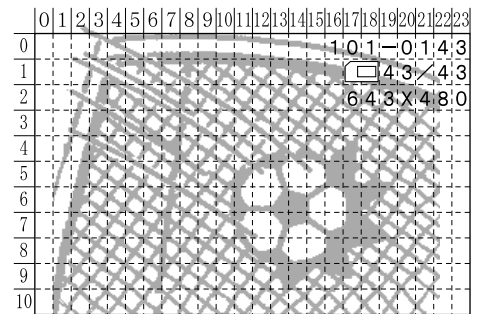


## 7-16-11 Forward Skip for Card Playback

If you press and hold the card “+” (or “-”) button during card playback (single playback), you can quickly go to the desired card image.

On the card counter display of “display no./total count”, the display no. will be changed while you press and hold the button, and the image when you release the button will be read out and displayed

- \* If the display no. exceeds the total count during card feeding, the display no. will restart from 1.
- \* If the display no. gets smaller than “1”, the display no. will restart reversely from total count.



## Card Related Cautions for All Modes

### \* Cautions

- When the red “>>>>” mark (this mark is white “□” in the Mirror Photo mode/Memory mode and in the Line Out screen) is blinking facing toward the Card mark (>>>>), this means that the card is being written, so never remove the card, disconnect the battery pack or AC power cord at this time. Such actions can damage the images being recording (marking readout and playback impossible) or even damage all of the images already recorded on the card.
- When the green “<<<<” mark is blinking facing away from the Card mark (□), data is being read from the card, so the card should never be removed at this time.
- Always turn the Power switch to the “OFF” position before inserting or ejecting a card.

# CHAPTER 2. TECHNICAL DESCRIPTION

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## 1. P.C.B Functions

### (1) MAIN P.C.B.

#### System-Control Section

- IC100 MAIN MI-COM : Servo, Video, Audio Control, System Control
- IC101 RESET : MAIN MI-COM reset
- IC200 E3V REG&RESET : E3V regulator, MODE MI-COM reset
- IC201 EEPROM : EEPROM for recorder data
- IC202 LANC INTERFACE : LANC interface
- IC203 SUB MI-COM : Power Supply Control, Clock

#### Camera Section

- IC1101 DIC4 : Camera digital signal processing
- IC1102 SDRAM : Memory for DIC4
- IC1104,5 AND : AND gate for control signal
- IC1106 INVERTER : Inverter amplifier for clock
- IC1301 4.0V REGULATOR : 4.0V regulator
- IC1302,3 OPE AMP : Operational amplifier for IRIS control
- IC1304 MOTOR DRIVER : AF/PZ motor drive
- IC1401 CAMERA MI-COM : AE, AWB, AF, EIS, DE control
- IC1402 RESET : CAMERA MI-COM reset
- IC1403 EEPROM : EEPROM for camera data
- IC1404 EVR (D/A CONVERTER) : (EVR)D/A converter for camera adjustment

#### CVF Section

- IC1501 EVR (D/A CONVERTER) : D/A converter for EVR of EVF section
- IC1502 EVF DRIVER : EVF LCD (CVF) drive
- IC1503 SWITCH : EVF display character mixing switch

#### Video Section

- IC2000 VRP2 : Recording/Playback head amplifier
- IC2100 VIF2 : Analog video input/output signal processing
- IC2301 VIC2 : Digital VCR signal processing LSI + SDRAM
- IC2302 AND : AND gate for control signal
- IC2600 CHARACTER GENERATOR : Character generator for LCD, EVF display
- IC2601 INVERTER : Inverter amplifier for clock

#### PM Section

- IC3201 DC/DC CONVERTER CONTROL : Power supply PWM regulator controller
- IC3202 DC/DC CONVERTER CONTROL : Power supply PWM regulator controller
- IC3203 4.7V REGULATOR : 4.7V regulator for video, audio, digital control
- IC3219 2.8V REGULATOR : 2.8V regulator

#### Card Section (MC model only)

- IC4000 FLASH : Memory for card firmware
- IC4001 V53 : Card control
- IC4002 SDRAM : Memory for SIC signal processing
- IC4003 SIC : Card video processing, Card interface

(2) SUB P.C.B.

Servo Section

- IC300 MOTOR DRIVE : Drum, Capstan, Loading motor drive
- FL300 5.6V REGULATOR : 5.6V regulator for motor drive
- Remote control light receptor, tally lamp

Gyro Section

- IC1601 P SENSOR GYRO : Pitch direction angular velocity detection
- IC1602 Y SENSOR GYRO : Yaw direction angular velocity detection
- IC1603 SW : Switch for gyro sensor output reset
- IC1605 OPE AMP : Operational amplifier for gyro sensor output signal

(3) CA P.C.B.

Camera Section

- IC1001 TIMING GENERATOR : Timing generator for CCD drive
- IC1003 CDS/AGC/AD : CCD output signal sampling, AGC, A/D converter
- IC1005 VCO PLL : Camera clock phase lock
- IC1006 INVERTER : Inverter amplifier for clock
- IC1007,8,9 AND : AND gate for clock voltage conversion

(4) CCD P.C.B.

- IC1000 CCD : CCD image sensor

(5) AUDIO P.C.B.

- IC701 OPE AMP : Operational amplifier for microphone
- IC801 AUDIO INTERFACE : Analog input/output signal processing
- IC802 A/D,D/A CONVERTER : Audio signal A/D,D/A conversion
- IC803 5.0V REGULATOR : 5.0V regulator

(6) LCD P.C.B.

- IC901 EEPROM : EEPROM for LCD data
- IC902 LCD INTERFACE : LCD signal processing, drive
- IC4201 DC/DC CONVERTER : Backlight drive

(7) CVF P.C.B.

Signal relay from MAIN P.C.B. to CVF-LCD, Backlight LED illumination

(8) MULTI P.C.B.

Connector for Docking unit (DU-300)

(9) LI P.C.B.

Backup lithium battery terminal, Power LED, START/STOP SW

(10) MMC P.C.B.

Connector for card insertion

## 2. Power Supply Circuit

### 2-1 Startup of Power Supply

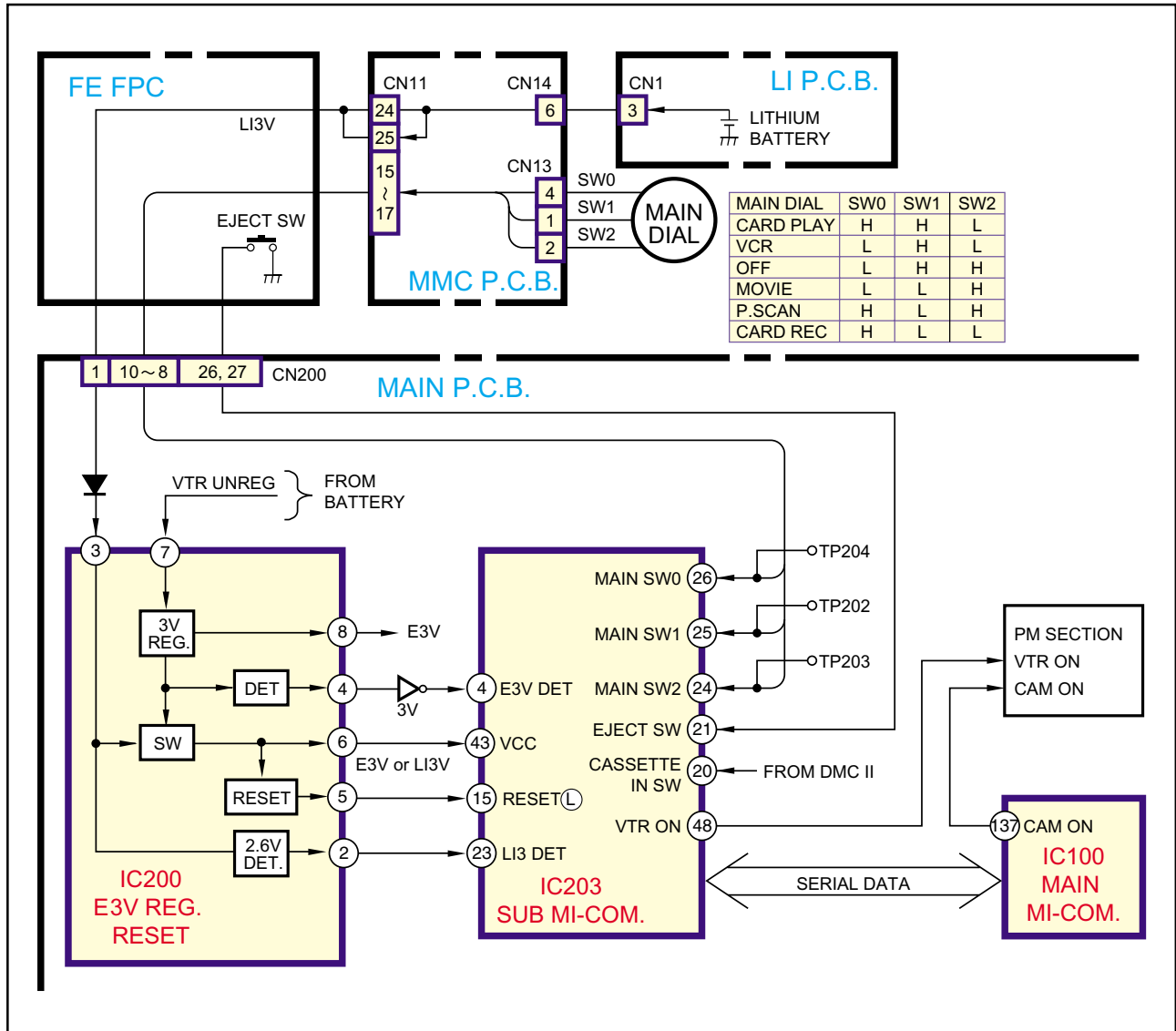


Fig. 2-1

- Lithium Battery for Backup

LI3V from the lithium battery is input at pin 3 of IC200, then output from pin 6 as power supply for the SUB MI-COM. This allows the SUB MI-COM to provide data backup and a clock function when main power supply is not connected.

If the lithium battery voltage drops below 2.6V (or even when lithium battery is not mounted), IC200 outputs an "L" signal from pin 2, and when power is ON, the SUB MI-COM receives the "L" signal and sends it to the MAIN MI-COM, which provides a warning indication for the lithium battery.

- Main Power Supply

VTR UNREG from the main power supply enters pin 7 of IC200, is converted to 3V by the internal regulator, and is then output as E3V from pin 8. The signal is also replaced with LI3V by the internal switch and then output from pin 6 as power supply to the SUB MI-COM.

Upon receiving VTR UNREG, IC200 outputs "L" signal from pin 4. SUB MI-COM receives this and recognizes that the main power supply is connected, then carries out initialization of the mechanisms after which it enters a standby status. In this condition, SUB MI-COM performs detection of switches related to startup, and outputs VTR ON "H" signal from pin 48 upon detection. By means of VTR ON signal, the recorder power supply is started up and the MAIN MI-COM is also started. If camera mode has been selected, the MAIN MI-COM receives this signal from the SUB MI-COM and outputs CAM ON "H" signal which starts up the camera power supply.

## 2-2 Power Fuses

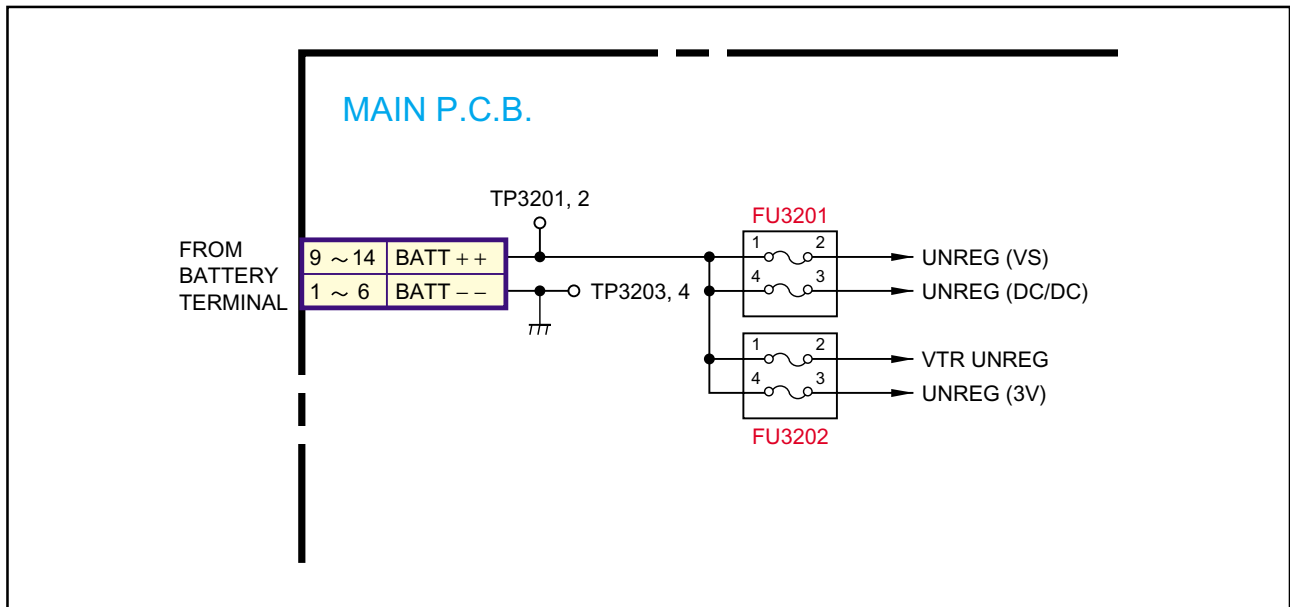


Fig. 2-2

Power from the battery is divided into four systems by FU3201,2 on MAIN P.C.B.

- (1) UNREG (VS) : FU3201  
DRUM/CAPSTAN VS, 5V system power supply, Lens motor, Recorder motor driver, CVF backlight power supply
- (2) UNREG (DC/DC) : FU3201  
DC/DC CONVERTER CONTROL IC power supply
- (3) VTR UNREG : FU3202  
1.7V system power supply, CCD -6.5V/15V, LCD12V, E3V, LANC, LCD backlight power supply
- (4) UNREG (3V) : FU3202  
2.3V system, 3V system power supply



## 2-3 Power Supply Circuit

Figure 2-3 shows the various power supply circuits.

The ON/OFF of each power supply is controlled by VTR ON output from SUB MI-COM and CAM ON output from MAIN MI-COM.

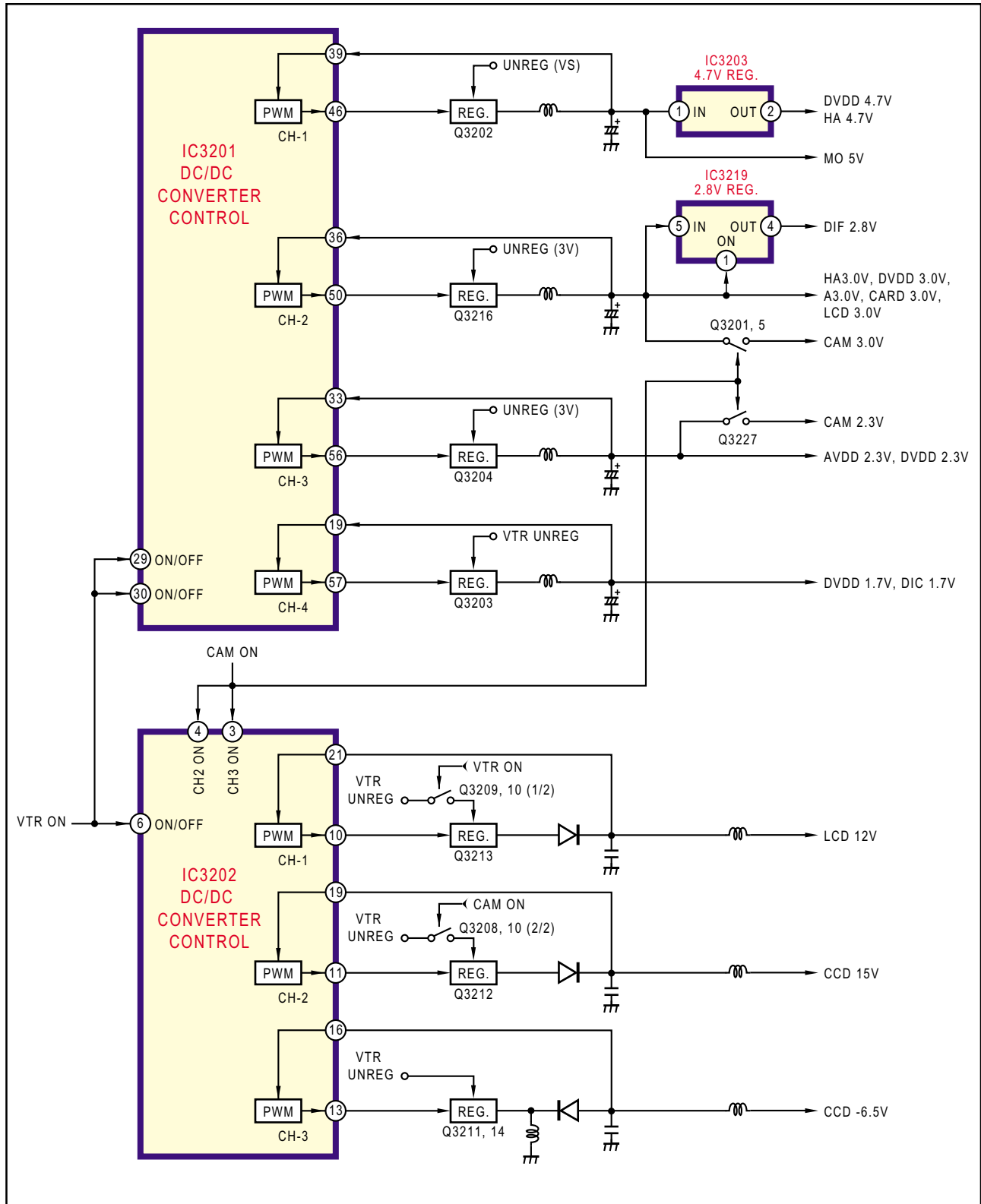


Fig.2-3

### 3. Signal Processing Circuit

#### 3-1 Outline of Signal Processing Circuit

Figure 2-4 shows the overall block diagram of the signal processing circuit and the flow of video and audio signals.

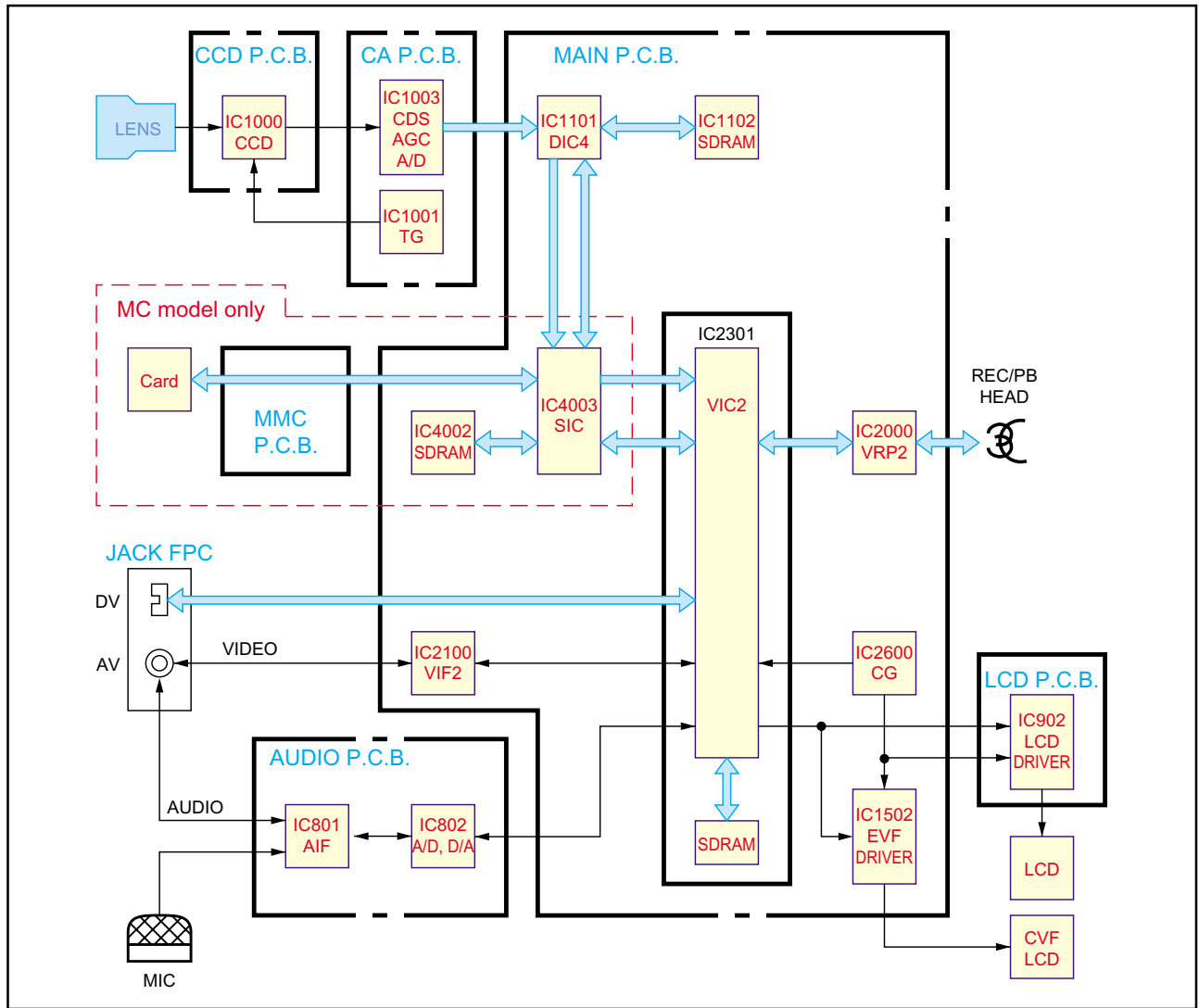


Fig. 2-4

## 3-2 Camera, Card Signal Processing

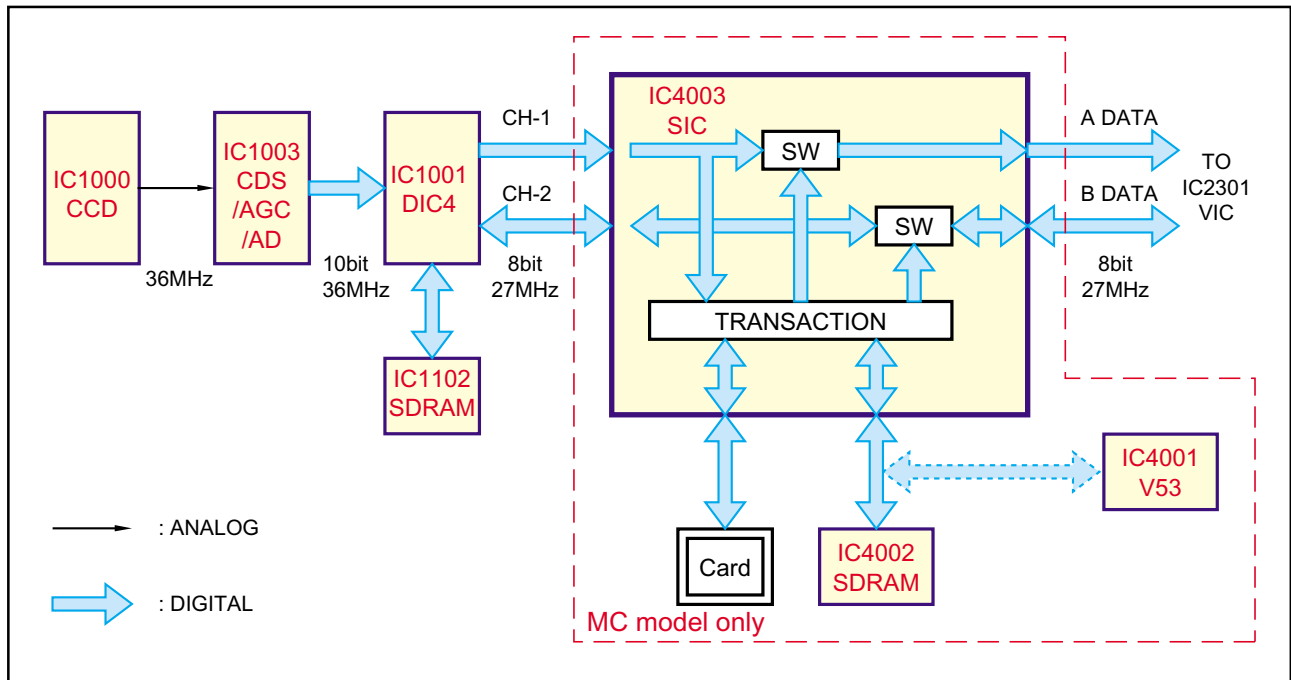


Fig. 2-5

### (1) Camera

#### <CCD> IC1000

- 1/4 inch
- 680,000 pixels (including electronic IS area)
- Single-line double-speed readout : Readout clock is set for double speed, and both odd and even parts are read out in a single field period (progressive mode).
- Primary color filter
- All pixel readout

#### <CDS/AGC/AD> IC1003

Signal read out from CCD is subjected to sample hold, AGC processing, A/D conversion, and then output as a digital signal.

#### <DIC4> IC1101

Carries out Y/C separation, various camera signal processing (EIS, AWB, etc.), and digital effect processing. Since, at playback, digital effect processing is applied to the playback signal, CH-2 is for input and CH-1 for output.

#### <SDRAM> IC1102

Field memory for signal processing, digital effect.

### (2) Card (MC model only)

#### <SIC> IC4003

When the card function is not operated, camera signal is sent directly to VIC2.

- Video signal capture function
- Video signal switch (card mix function)
- JPEG compression/decompression
- Image enlargement/reduction
- Card interface

#### <SDRAM> IC4002

Image data memory used at Card write-in, readout.

#### <V53> IC4001

A CPU for the card circuit, which executes firmware located in the flash memory (IC4000), communicates with the MAIN MI-COM via SIC, and conducts various card processing through control of SIC.

### Card Recording (CAMERA)

- (1) DIC4 captures image initially for matching recorded image with image displayed on LCD.
- (2) SIC stores image in SDRAM (IC4002).
- (3) SIC applies JPEG compression to image, and starts writing into Card.
- (4) VIC2 captures image and DIC4 releases the capture function.
- (5) DIC4 starts camera signal processing, and provides movie image display.
- (6) When SIC finishes write-in to Card, VIC2 releases the capture function.

### Card Recording (VCR, DV input)

- (1) VIC2 captures image.
  - (2) By way of SIC (B DATA) and DIC4 (CH-2), SIC again stores in SDRAM (IC4002) the image captured in SIC (CH-1).
  - (3) SIC applies JPEG compression to the image, and starts writing into Card.
  - (4) When SIC finishes write-in to Card, VIC2 releases the capture function.
- (At playback/recording: Image from VIC2 appearing at LCD and video output is A DATA image via SIC, DIC4.)  
(At DV input: Image from VIC2 appearing at LCD and video output is the image captured at (1).)

### Card Playback

- (1) SIC decompresses the Card file.
- (2) SIC stores an image in SDRAM (IC4002).
- (3) VIC2 captures an image (A DATA) and outputs it at LCD and video output.

### Card Mixing

The selected image that has been decompressed at Card and stored in SDRAM (IC4002) is mixed with the camera image via the switch in SIC.

In progressive mode : A DATA and B DATA are mixed with card image.

In interline movie mode : A DATA is mixed with card image.

### 3-3 Recorder Signal Processing

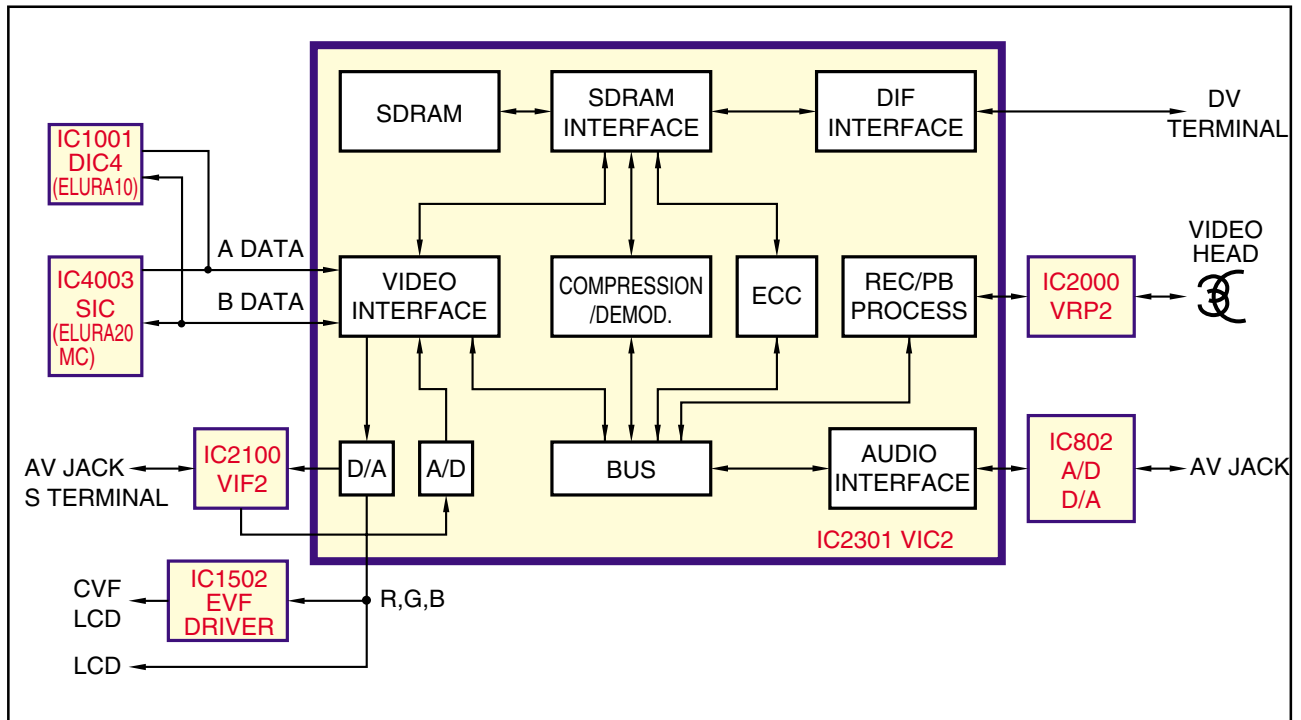


Fig. 2-6

#### < VIC2 > IC2301

- Includes an A/D converter for analog line input plus a Y/C separation filter.
  - D/A output for VRP2 control is added.
  - A/B DATA: input in camera mode. B DATA is output and A DATA is input at playback. (DIC4 digital effect circuit is used at playback.)
- The video data and signals input to VIC2 are subjected to digital VTR format signal processing. Audio data, subcode data and ITI data are also created at VIC2, and these signals are output to VRP2 as 41.85 Mbps data of DV format.
- DIF : After conversion to digital data conforming to IEEE1394 standard, the data is output at DV terminal. At digital input, the data enters VIC2 signal processing circuit via the opposite route.

#### < VRP2 > IC2000

- Recording data of 41.85 Mbps output from VIC2 is amplified at VRP2, and is recorded on magnetic tape while undergoing head switching of CH-1, CH-2 with a switching pulse. At playback, the head output signal is amplified and sent to VIC2.

#### < VIF2 > IC2100

- Related parts are reduced in comparison to conventional VIF, and a sync separation function for analog line input is added. Y and C signals sent from VIC2 are output as Y, C signals for S terminal (DU-300) and composite video.
- At line input, input signals undergo level adjustment, sync signal separation and are output to VIC2.

#### < EVF DRIVER > IC1502

EVF driver, formerly mounted on CVF P.C.B., has been moved to MAIN P.C.B., and displays on CVF LCD an image based on R, G, B and sync signals from VIC2.

### 3-4 Audio Signal Flow

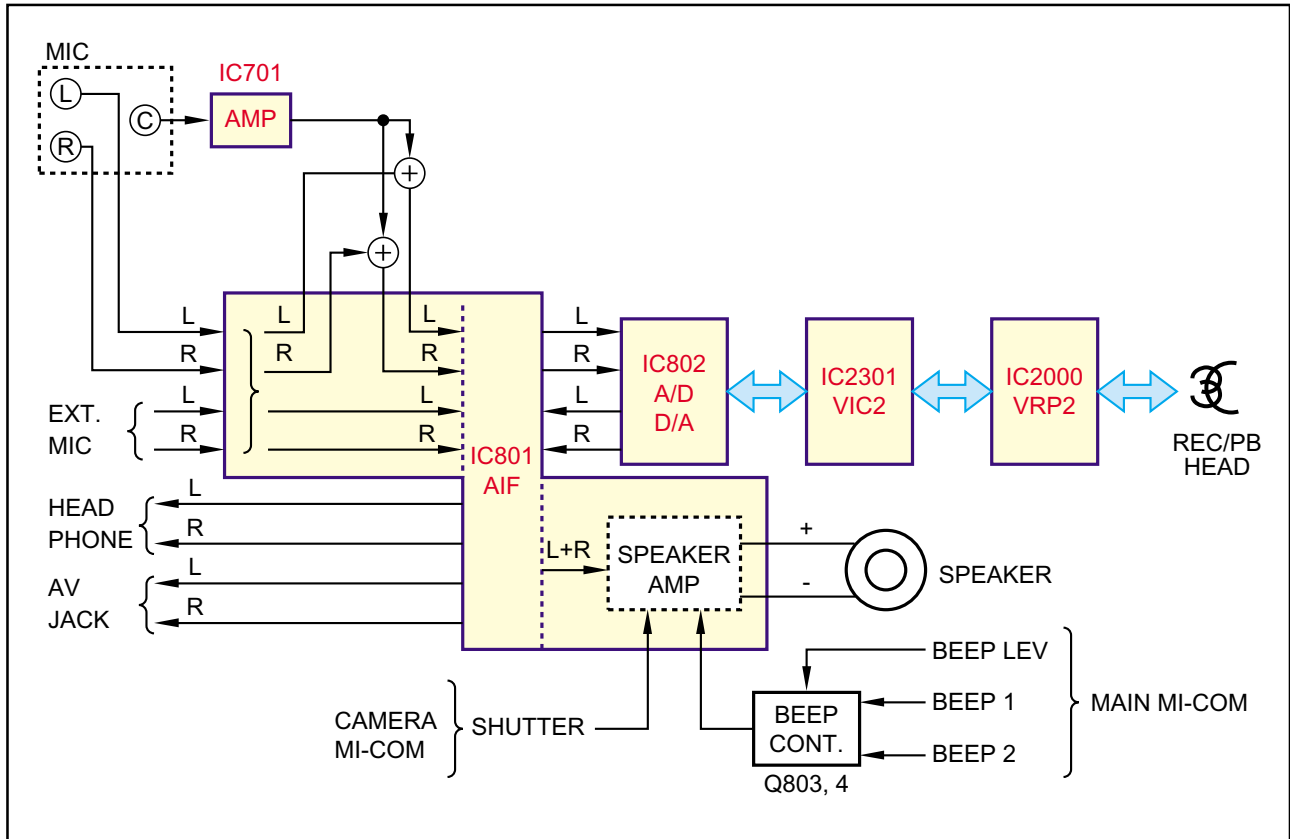


Fig. 2-7

#### <MIC AMP> IC701

Processing is applied to output signal of microphone element C whereby it is mixed with L and R signals. The former nondirectional microphone is thus changed to a stereo microphone having directivity

#### <AIF> IC801

Carries out switching between internal and external microphones (by means of serial data from MAIN MI-COM), plus ALC (Auto Level Control), and amplification of each output signal.

Also, the shutter sound at card recording from the CAMERA MI-COM and the beep tone issued at ejection from the MAIN MI-COM are added to the speaker output signal in AIF.

#### <A/D,D/A> IC802

Carries out analog - digital signal conversion. Sampling frequency is output from VIC2 and is  $F_s=32$  KHz or  $F_s=48$  KHz depending on the audio mode. Quantization bit number is 12 bits in case of 32 KHz or 16 bits in case of 48 KHz.

## 4. System Control, Servo

### 4-1 Outline of System Control, Servo

Figure 2-8 shows the overall configuration of the system control & servo circuit, plus the flow of data. System control is mainly performed by the MAIN MI-COM (IC100) on MAIN P.C.B.

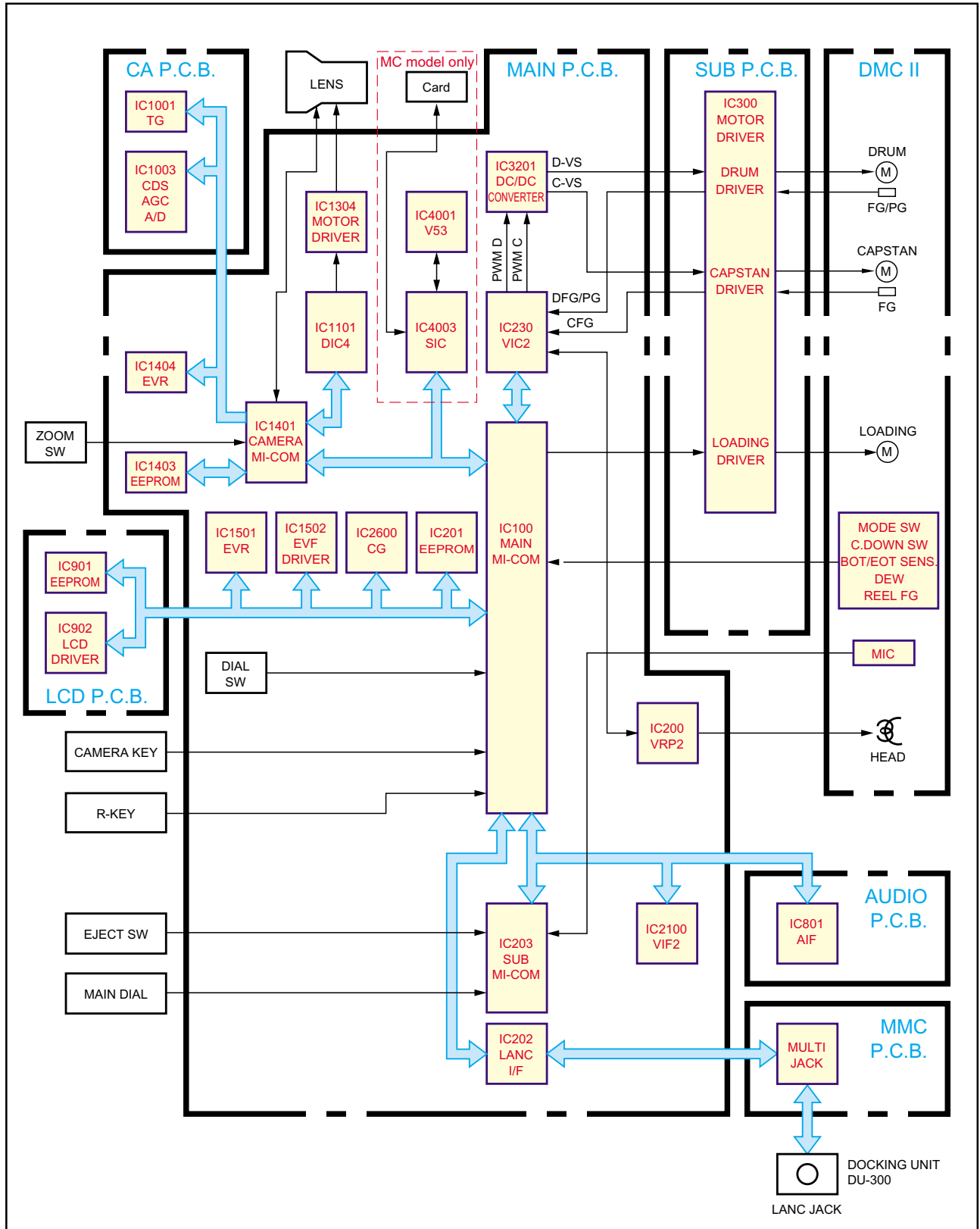


Fig. 2-8

## 4-2 Major Functions of Each Microcomputer

### (1) MAIN MI-COM (IC100)

The MAIN MI-COM, as the nucleus of the system, carries out control of mode transition plus mechanism control through communication with CAMERA MI-COM. It also detects the input of various sensors and switches (DMCII). Following are the major functions.

- VIC2 (Video IC) control/VIF2 (Video Interface) control/AIF (Audio Interface) control
- Control in accordance with IEEE1394
- Key input
- LANC communication
- LCD control
- OSD (On Screen Display) control
- DMCII mechanism control

### (2) SUB MI-COM (IC203)

The SUB MI-COM is mainly in charge of the power-on sequence and charging control. Following are the major functions.

- Key input
- Remote control input
- Power ON/OFF control
- MIC (Memory In Cassette) control

### (3) CAMERA MI-COM (IC1401)

Carries out lens control and camera signal processing. Following are the major functions.

- CCD drive control
- AE, AF, AWB control
- EIS (Electric Image Stabilizer) control
- Zoom key input

## 4-3 Servo Control

Servo control is made by the MAIN MI-COM. and VIC2 the same as heretofore. The MAIN MI-COM. controls motor ON/OFF, turning direction, etc. and VIC2 controls the speed of revolution, phase and outputs the signal. The signal flow is such that VIC2 detects the FG/PG, PB-RF, etc. from motor and send them to the MAIN MI-COM. The MAIN MI-COM generates the error signal and outputs it to the VIC2 again. The VIC2 outputs the error signal (PWM), and the MAIN P.C.B. drives that signal and sends it to the motor driver IC as a control voltage.



## 4-4 Error Detection

If an anomaly has been produced in any rotation drive system (drum, capstan, reel, loading), a relevant mode enters. The LCD indicates “Please unload the cassette” and blinks “EJECT.”

### 4-4-1 Error Detecting Conditions

The following table gives error detecting conditions.

Kind	Condition		Detection
Drum error	Error detecting mode	Starting / steady	D-FG
	FG frequency when steady	900Hz	
	Error detecting level	Starting: Beyond 80-150%. Steady : 30% max.	
	Error detecting time	Starting : 5sec. Steady : 0.5sec.	
Capstan error	Error detecting mode	Starting / steady	C-FG
	FG frequency when steady	1347Hz	
	Error detecting level	Starting : 80% max. Steady : 100Hz max.	
	Error detecting time	Starting : 2sec. Steady : 0.5sec.	
Reel error	Error detecting mode	Normal / UNLOAD	T, S-REEL FG C-FG
	Error detection	Normally : C-FG number per reel FG cycle is 2.4×1347 or more. UNLOAD : Reel FG half cycle is 1 sec or more (Take-up reel only for both)	
Loading error	Error detecting mode	Mode transfer	Mode SW
	Error detection	Mode transfer time STANDBY-STOP : 6sec STANDBY-POPUP : 3sec STOP-PLAY : 3sec	

### 4-4-2 Processing after Error Detection

The following table gives processing after error detection.

	Cassette in	Loading	During loading	Loading completed	During tape running	During mode
Drum error	Pop up	Pop up	Error stop	Error stop	Error stop	Error stop
Capstan error	Pop up	-----	Error stop	Error stop	Error stop	Error stop
Reel error	-----	-----	Error stop	Error stop	Error stop	Error stop
Loading error	Pop up	Pop up	Error stop	Error stop	-----	Error stop

- Pop up : Error display→error eject → pop up →error clear
- Error stop : Error display→STOP position (not cleared unless EJECTED)

## 4-5 IC Terminal Functions

### 4-5-1 CAMERA MI-COM (IC1401)

PIN	NAME	I/O	FUNCTION	REMARKS			
				PG	BK	ADDR	DATA BIT
1	VCC		CAM 2.3V				
2	CG STB	O	CG strobe output (for development/plant use)				
3	I ISW	O	Bypass capacitor charging SW (for Gyro output)	5	0	9027	5
4,5	-	O	Unused				
6	VCCB1		CAM 3V				
7	VSSB1		GND				
8	ADJ SW	I	(Pull up) for plant adjustment	5	0	9022	0
9	ADJ CS	O	CS for plant adjustment	5	0	9022	1
10	NT XPL SEL	I	Camera microcomputer NTSC/PAL selection	5	0	9022	2
11	TG NP SEL	O	TG NTSC/PAL selection (connect to /NPSEL of TG)	5	0	9022	3
12	TG SEN	O	TG serial communication enable signal	5	0	9022	4
13	X TG RST	O	TG reset signal	5	0	9022	5
14	DA LOAD	O	D/A load pulse (to LD of MB88347L)	5	0	9022	6
15	X AGC CS	O	AGC chip select	5	0	9022	7
16	VCCB1		CAM 3V				
17	VSSB1		GND				
18	IRIS CL	O	Unused				
19	IRIS OP	O	Unused				
20	X IRIS GAIN	O	Iris gain	5	0	9023	2
21	LED RET	O	Lens LED illumination	5	0	9023	3
22	X F PSV	O	Focus power save	5	0	9023	4
23	X Z PSV	O	Zoom power save	5	0	9023	5
24	F RES SW	I	Focus reset detection (Pull Down)	5	0	9023	6
25	Z RES SW	I	Zoom reset detection (Pull Down)	5	0	9023	7
26	X PC CS	O	For AF debugging	5	0	9024	0
27	CAM DIC RST	O	CAM DIC RST (to MODE)	5	0	9024	1
28	X PC ACK	I/O	For AF debug/WB debug	5	0	9024	2
29	X DIC4 RST	O	Unused	5	0	9024	3
30	EEP INI	I	EEPROM initialization (Pull Up)	5	0	9024	4
31	X EEP CS	O	EEPROM chip select (to CS)(Pull Up)	5	0	9024	5
32	X EEP WP	O	EEPROM write protect (to WC)(Pull Up)	5	0	9024	6
33	EEP RB	I	EEPROM READY/BUSY (to R/B)	5	0	9024	7
34	VCCB1		CAM 3V				
35	VSSB1		GND				
36	CAM CS	O	SUB MI-COM communication CS	5	0	9025	0
37	DIC4 RST DET	I	From Mode DIC4 RST OUT	5	0	9025	1
38	CAM RX	O	SUB MI-COM send/receive discrimination signal	5	0	9025	2
39	DIC CS	O	DIC CS (To DIC)	5	0	9025	3
40	FIC CS	O	FIC CS (To DIC)	5	0	9025	4
41	PWM CS	O	PWM CS (To DIC)	5	0	9025	5
42	DIC READ	O	DIC data read (Pull Down)	5	0	9025	6
43	FID	I	Field index input (From DIC)	5	0	9025	7
44	TEST1		TEST OUT1				
45	TEST2		TEST OUT2				
46	TEST3		TEST OUT3				

PIN	NAME	I/O	FUNCTION	REMARKS			
				PG	BK	ADDR	DATA BIT
47	WB SET		WB SET (for debug)				
48	VCCB1		CAM 3V				
49	-		Unused				
50	VSSB1		GND				
51	VSS		GND				
52~65	-		Unused				
66	VCCP		CAM 3V				
67,8	-		Unused				
69	VSS		GND				
70,1	-		Unused				
72	Shutter Audio	O	PWM output (for shutter sound)	5	0	902B	3
73~79	-		Unused				
80	SCLK3	O	TG/AGC/DA serial clock	5	0	902A	1
81	SDI3	I	Unused				
82	SDO3	O	TG/AGC/DA serial data send	5	0	9029	7
83	-		Unused				
84	MtoC SCLK	I	SUB serial clock	5	0	9029	4
85	MtoC DATA	I	SUB serial data receive	5	0	9029	3
86	CtoM DATA	O	SUB serial data send	5	0	9029	2
87	-		Unused				
88	VCCP		CAM 3V				
89	VSSP		GND				
90,1	-		Unused				
92	DIC SCLK1	O	DIC serial clock	5	0	9028	7
93	DtoC DATA1	I	DIC serial data receive	5	0	9028	6
94	CtoD DATA1	O	DIC serial data send	5	0	9028	5
95,6	-		Unused				
97	SCLK0	O	EEPROM serial clock	5	0	9028	2
98	SDI0	I	EEPROM serial data receive	5	0	9028	1
99	SDO0	O	EEPROM serial data send	5	0	9028	0
100	VCC		CAM 2.3V				
101	VCCP		CAM 3V				
102	JTAG	I	FP (JTAG terminal)(Pull Up)				
103	TDO		FP (JTAG terminal)				
104	TDI		Pull Up (JTAG terminal)				
105	TMS		Pull Up (JTAG terminal)				
106	TRCLK		Unused				
107	EVENT0		Unused				
108	EVENT1		Unused				
109	TCK		FP (JTAG terminal)				
110	TRST#		Connect to reset IC output				
111	VSSP		GND				
112	FP		Pull Down (flash protect)				
113	MODE2		GND				
114	MODE1		GND				
115	MODE0		MCU mode fixed (Pull Down)				
116	FVCC		CAM 2.3V (flash erase program)				
117	VSS		GND				
118	RESET		Connect to reset IC output				

PIN	NAME	I/O	FUNCTION	REMARKS			
				PG	BK	ADDR	DATA BIT
119	GND						
120	OSCVCC		CAM 2.3V (=VCC)				
121	XIN		Main clock input				
122	OSCVSS		GND				
123	XOUT	O	Main clock output				
124	PLLVC		CAM 2.3V				
125	PLLCAP		PLL condenser connection				
126	PLLVSS		Connect to GND				
127,8	-		Unused				
129	VSSB0		GND				
130	VCCB0		CAM 3V				
131	CAM SS TIM2	O	Slow shutter timing signal (to Mode)	5	0	9021	5
132	CAM SS TIM1	O	Slow shutter timing signal (to Mode)	5	0	9021	4
133~139	-		Unused				
140	VCCP		CAM 3V				
141	VSSP		GND				
142	SBI	I	System break interrupt (Pull Down)				
143	X VD	I	VD signal (from DIC)	5	0	902C	0
144	-		Unused				
145	CAM REQ	I	M to C mode microcomputer communication request (Pull Down)	5	0	902C	2
146	X PC REQ	I/O	For AF debug/WB debug (for development)				
147	ADJ REQ	I	For plant adjustment (Pull Down)				
148,9	-		Unused				
150	VCC		CAM 2.3V				
151	VSS		GND				
152~156	-		Unused				
157	VCCP		CAM 3V				
158	VSSP		GND				
159~176	-		Unused				
177	XCIN		CAM 2.3V				
178	VSSR		GND (real time clock GND)				
179	XCOUT	O	Unused				
180	VCCR		CAM 3V (real time clock power supply)				
181	AVREF		A/D reference voltage input (connect to CAM 3V)				
182	AVCC		A/D power supply input (connect to CAM 3V)				
183	Y GYRO	I	Yaw direction gyro input	5	0	32DE,32DF	
184	P GYRO	I	Pitch direction gyro input	5	0	32E0,32E1	
185,6	-		Connect to GND				
187	I ENC	I	Iris encoder AD input	5	0	2DC8,2C9H	
188	ZOOM KEY	I	Zoom key AD input	5	0	2B95	
189	TM SENS	I	Temperature compensation AD input (Pull Down)	5	0	3136	
190	-		Connect to GND				
191~198	-		Unused				
199	AVSS		Connect to GND				

#### 4-5-2 MAIN MI-COM (IC100)

PIN	NAME	I/O	FUNCTION	REMARKS			
				PG	BK	ADDR	DATA BIT
1	VCC		DVDD 2.2V				
2	VIF CS	O	VIF chip select	7	2	D7	3
3	XECSV	O	VIC2 (VIC CS) chip select	7	2	D7	2
4	XECSE	O	VIC2 (DIF CS) chip select	7	2	D7	1
5	OPT CS	O	OPT chip select (for factory adjustment)	7	2	D7	0
6	VCCB		BUS power supply = DVDD3V				
7	VSSB		BUS GND				
8	MIRR	O	Panel OSD OFF during mirror mode	7	2	D2	7
9	BEEP LEVEL	O	Warning buzzer level control	7	2	D2	6
10	SIC RESET	O	SIC RESET	7	2	D2	5
11	SIC BBUSSEL	O	SIC B data bus input/output control	7	2	D2	4
12	SIC PSB	O	SIC power save	7	2	D2	3
13	MMC ON	O	MMC power ON/OFF control (fixed at ON)	7	2	D2	2
14	SIC CS	O	SIC chip select	7	2	D2	1
15	VCO HI	O	VRP VCO power save	7	2	D2	0
16	VCCB		Bus power supply = DVDD3V				
17	VSSB		Bus GND				
18	XRESET	O	VIC initial signal	7	2	D3	7
19	EADDR6	O	Address bus (VIC2)	7	2	D3	6
20	EADDR5	O	Address bus (VIC2)	7	2	D3	5
21	EADDR4	O	Address bus (VIC2)	7	2	D3	4
22	EADDR3	O	Address bus (VIC2)	7	2	D3	3
23	EADDR2	O	Address bus (VIC2)	7	2	D3	2
24	EADDR1	O	Address bus (VIC2)	7	2	D3	1
25	EADDR0	O	Address bus LSB (VIC2)	7	2	D3	0
26	EDATA15	I/O	Data bus MSB (VIC2)	7	2	D4	7
27	EDATA14	I/O	Data bus (VIC2)	7	2	D4	6
28	EDATA13	I/O	Data bus (VIC2)	7	2	D4	5
29	EDATA12	I/O	Data bus (VIC2)	7	2	D4	4
30	EDATA11	I/O	Data bus (VIC2)	7	2	D4	3
31	EDATA10	I/O	Data bus (VIC2)	7	2	D4	2
32	EDATA9	I/O	Data bus (VIC2)	7	2	D4	1
33	EDATA8	I/O	Data bus (VIC2)	7	2	D4	0
34	VCCB		Bus power supply = DVDD3V				
35	VSSB		Bus GND				
36	EDATA7	I/O	Data bus (VIC2)	7	2	D5	7
37	EDATA6	I/O	Data bus (VIC2)	7	2	D5	6
38	EDATA5	I/O	Data bus (VIC2)	7	2	D5	5
39	EDATA4	I/O	Data bus (VIC2)	7	2	D5	4
40	EDATA3	I/O	Data bus (VIC2)	7	2	D5	3
41	EDATA2	I/O	Data bus (VIC2)	7	2	D5	2
42	EDATA1	I/O	Data bus (VIC2)	7	2	D5	1
43	EDATA0	I/O	Data bus LSB (VIC2)	7	2	D5	0
44	VIC XERD	O	VIC2	7	2	D6	3
45	VIC XEWR	O	VIC2	7	2	D6	2
46	WIDE CONT	O	S1 signal control output	7	2	D6	1
47	LINE IN	O	LINE input circuit control	7	2	D6	4
48	VCCB		Bus power supply = DVDD3V				
49	BCLK		Check pad	7	2	D6	0
50	VSSB		GND				

PIN	NAME	I/O	FUNCTION	REMARKS			
				PG	BK	ADDR	DATA BIT
51	VSS		GND				
52	CAM RX DATA	I	Camera communication data discrimination	7	2	DD	3
53	DIC2S FI	I	DIC shrink FI (not used)	7	2	DD	2
54	CAM SS TMG1	I	Camera still picture control 1 input	7	2	DD	1
55	CAM SS TMG2	I	Camera still picture control 2 input	7	2	DD	0
56	PHOTO SW	I	Memory switch full pressing detection input	7	2	DE	7
57	HALF PHOTO SW	I	Memory switch half pressing detection input	7	2	DE	6
58	START/STOP	I	Trigger switch input	7	2	DE	5
59	PAE/GREEN SW	I	PAE mode select switch detection input	7	2	DE	4
60	PANEL OPEN SW	I	Panel open switch detection input	7	2	DE	3
61	PANEL BOTTOM/TOP SW	I	Panel BOTTOM/TOP switch detection input	7	2	DE	2
62	CASSETTE IN SW	I	CASSETTE IN switch detection input	7	2	DE	1
63	REC PROOF SW	I	Record inhibit switch detection input	7	2	DE	0
64	DIAL CW SW	I	Dial detection input	7	2	DF	7
65	DIAL CCW SW	I	Dial detection input	7	2	DF	6
66	VCCP		DVDD3V				
67	AIF CS	O	AIF2 chip select output	7	2	DB	0
68	EXT CONT	O	External microphone detection output	7	2	DB	1
69	VSSP		GND				
70	PD DA	O	Audio DA power save control	7	2	DB	2
71	PD AD	O	Audio AD power save control	7	2	DB	3
72	A MUTE	O	Audio mute	7	2	DB	4
73	A EMP2	O	Audio emphasis setting	7	2	DB	5
74	A EMP1	O	Audio emphasis setting	7	2	DB	6
75	AUD ON	O	Speaker/headphones power supply control	7	2	DB	7
76	BUZZER CARRIER2	O	Buzzer 2 output	7	2	DA	0
77	BUZZER CARRIER1	O	Buzzer 1 output	7	2	DA	1
78	RESERVE2	I	V53 firmware update status detection	7	2	DA	2
79	TEST1		For factory adjustment	7	2	DA	3
80	EVF SENS	O	IC chip select for EVF drive	7	2	DA	6
81	LANC IN	I	LANC data input	7	2	DA	7
82	LANC OUT	O	LANC data output	7	2	D9	0
83	EVF DA LOAD	O	DA converter load for EVF	7	2	D9	1
84	AIF/VIF/SUB SCK	I/O	Serial clock (AIF/VIF/SUB MI-COM)	7	2	D9	3
85	SUB SI	I	Serial bus data input (SUB MI-COM)	7	2	D9	4
86	AIF/VIF/SUB SO	O	Serial bus data output (AIF/VIF/SUB MI-COM)	7	2	D9	5
87	PANEL IC CS	O	LCD interface chip select output	7	2	D9	2
88	VCCP		DVDD3V				
89	VSSP		GND				
90	PANEL EEPROM CS	O	LCD EEPROM chip select output	7	2	D9	6
91	MAIN EEPROM CS	O	EEPROM chip select output	7	2	D9	7
92	OSD/EEPROM/DA SCK	O	OSDC/EEPROM/LCD EEPROM/DA/EVFIC/LCDIC	7	2	D8	0
93	EEPROM SI	I	Serial data input (EEPROM/LCD EEPROM)	7	2	D8	1
94	OSD/EEPROM/DA SO	O	OSD/EEPROM/LCD EEPROM/DA/EVFIC/LCD Data output	7	2	D8	2
95	DIC4 CONT	O	DIC4 control output	7	2	D8	3
96	DIC4 CS	O	DIC4 chip select output	7	2	D8	4
97	CAM/DIC4/SIC SCK	I	Serial clock input (CAMERA MI-COM/DIC4/SIC)	7	2	D8	5
98	CAM/SIC SI	I	Serial data input (CAMERA MI-COM/SIC)	7	2	D8	6
99	CAM/DIC4/SIC SO	O	Serial clock output (CAMERA MI-COM/DIC4/SIC)	7	2	D8	7
100	VCC		DVDD2.2V				
101	VCCP		DVDD3V				

PIN	NAME	I/O	FUNCTION	REMARKS			
				PG	BK	ADDR	DATA BIT
102	EMULATOR	I	10K pull up (FP) emulator (for factory adjustment)				
103	JTAG/EMULATOR/FLASH	O	FP (for factory adjustment)				
104	JTAG/EMULATOR/FLASH	I	10K pull up (for factory adjustment)				
105	JTAG/EMULATOR/FLASH	I	10K pull up (for factory adjustment)				
106	EMULATOR	O	FP (emulator) (for factory adjustment)				
107	EMULATOR	O	FP (emulator) (for factory adjustment)				
108	EMULATOR	O	FP (emulator) (for factory adjustment)				
109	JTAG/EMULATOR/FLASH	I	10K pull up (for factory adjustment)				
110	JTAG/EMULATOR	I	10K pull down (for factory adjustment)				
111	VSSP		GND				
112	FLASH	I	10K pull down (This terminal is open in the mask version.)				
113	GND		GND				
114	GND		GND				
115	MODE		10K pull down (for factory adjustment)				
116	EMULATOR/FLASH		10K pull down (for factory adjustment)				
117	VSS		GND				
118	REST IN		Reset signal input				
119	VSS		GND				
120	OSCVCC		DVDD2.3V				
121	XIN	I	20 MHz				
122	OSCVSS		GND				
123	XOUT	O	20 MHz				
124	PLLCVCC		DVDD2.3V				
125	PLLCAP		External capacitor for PLL is connected to this terminal				
126	PLLVSS		GND				
127	OSDC CS	O	OSDC IC chip select output	7	2	D1	0
128	OSDC RESET	O	OSDC reset output	7	2	D1	1
129	VSSB		GND				
130	VCCB		DVDD3V				
131	-	O	Unused	7	2	D1	2
132	-	O	Unused	7	2	D1	3
133	-	O	Unused	7	2	D1	4
134	FCHO	I	Factory process mode/soft debug terminal 0 (for factory adjustment)	7	2	D0	0
135	-	O	Unused	7	2	D1	5
136	CAM M RST	I	CAMERA MI-COM reset output	7	2	D0	1
137	CAM PW ON	O	Camera power supply control	7	2	D1	6
138	DA CFG	O	DA CFG (for factory adjustment)	7	2	DA	5
139	LET CONT	O	S1 signal letter box output	7	2	DA	4
140	VCCP		DVDD3V				
141	VSSP		GND				
142	N.C	I		7	2	E1	4
143	XINT M	I	VIC RP CAPTURE interrupt request input	7	2	DC	7
144	XINT D	I	VIC DIF interrupt request input	7	2	DC	6
145	XINT C	I	VIC SDRAM interrupt request input	7	2	DC	5
146	SUB REQ	O	Communication request input to SUB MI-COM	7	2	DC	4
147	SUB CS	I	Selection input from SUB MI-COM	7	2	DC	3
148	SIC REQ	O	Communication request to SIC	7	2	DC	2
149	RESERVE1	O	V53 detects enable/disable status of communication with MAIN MI-COM	7	2	DC	1
150	VCC		DVDD2.2V				

PIN	NAME	I/O	FUNCTION	REMARKS			
				PG	BK	ADDR	DATA BIT
151	VSS		GND				
152	DIC4 VD	I	[Interrupt] DIC4 VD input	7	2	DC	0
153	DIC XSYSRST	O	DIC/FIC reset output	7	2	DD	7
154	CAM CS	I	[Interrupt] CAMERA MI-COM chip select input	7	2	DD	6
155	CAM PHOTO	I	Timing signal input for photo(Unused)	7	2	DD	5
156	CAM REQ	O	CAMERA MI-COM communication request output	7	2	DD	4
157	VCCP		DVDD3V				
158	VSSP		GND				
159	RESERVE3	O	Unused	7	2	DF	5
160	HP DET	I	Headphones jack detection input	7	2	DF	4
161	EXT DET	I	External microphone detection input	7	2	DF	3
162	S DET	I	S-terminal connection detection	7	2	DF	2
163	PLUG IN	I	AV multi-terminal insertion detection	7	2	DF	1
164	MCLKEN	I	Clock enable of camera system	7	2	DF	0
165	LOAD	O	Loading motor control (LOAD)	7	2	E0	7
166	UNLOAD	O	Loading motor control (UNLOAD)	7	2	E0	6
167	ID REQ	I	N.C. (for development investigation)	7	2	E1	3
168	LMO CONT	O	Loading motor control (CONT)	7	2	E0	5
169	CAP ON	O	Capstan motor start/stop signal output	7	2	E0	4
170	XIDACK	O	N.C. (for development investigation)	7	2	E1	2
171	CAP FWD	O	Capstan motor rotation direction signal output	7	2	E0	3
172	TAPE LED	O	Tape LED illuminant control	7	2	E0	2
173	N.C	O		7	2	E1	1
174	DRUM ON	O	Drum motor start/stop signal output	7	2	E0	1
175	SELCSLP	O	Drum driver control	7	2	E1	0
176	REEL LED CONT	O	Reel sensor LED illumination power save	7	2	E0	0
177	XCIN	I	32 KHz				
178	VSSR		GND				
179	XCOUT	O	32 KHz				
180	VCCR		Power flag is set when VCCR decreases to 0.1 V or less once then increases back to 1.8 V.				
181	AVREF		DVDD3V				
182	AVCC		DVDD3V				
183	DEWDETECT	I	Dew condensation detection	7	2	C0	
184	KEY AD0	I	Operation key detection (STOP, REW, REC, PAUSE)	7	2	C1	
185	KEY AD1	I	Operation key detection (PLAY, FF, DE, ON/OFF)	7	2	C2	
186	KEY AD2	I	Operation key detection (MENU, EXP, FOCUS)	7	2	C3	
187	KEY AD3	I	Operation key detection (EXECUTE)	7	2	C4	
188	KEY AD4	I	Operation key detection (Unused)	7	2	C5	
189	S REEL FG	I	S-reel FG signal input	7	2	C6	
190	T REEL FG	I	T-reel FG signal input	7	2	C7	
191	TAPE TOP AD	I	Tape top sensor signal input	7	2	C8	
192	TAPE END AD	I	Tape end sensor signal input	7	2	C9	
193	MSW AD	I	Mechanism mode detection	7	2	CA	
194	RAGC	I	VRP AGC signal detection	7	2	CB	
195	WIDE DET	I	S1 signal voltage detection (wide signal detection)	7	2	CC	
196	MMC DET	I	MMC detection; "L" when card present	7	2	CD	
197	CARD PRO	I	Unused	7	2	CE	
198	CAM DIC RST	I	CAM DIC RST (to CAMERA)	7	2	CF	
199	AVSS		GND				



#### 4-5-3 SUB MI-COM (IC203)

PIN	NAME	I/O	FUNCTION	REMARKS			
				PG	BK	ADDR	DATA BIT
1	SUB CS	O	SUB MI-COM communication enable signal	7	3	FC	4
2	RMC PULSE IN	I	[Interrupt] input signal from remote controller	7	3	FC	3
3	SUB REQ	I	[Interrupt] MAIN MI-COM communication request input	7	3	FC	2
4	E3V DETECT	I	[Interrupt] E3V low voltage detection input	7	3	FC	1
5	N.C	O		7	3	FC	0
6	LANC PW CONT	O	LANC power supply control output	7	3	FA	3
7	SCLK2	O	SUB MI-COM serial clock output	7	3	FA	2
8	SIN2	O	SUB MI-COM serial data output	7	3	FA	1
9	SOUT2	I	SUB MI-COM serial data input	7	3	FA	0
10	MIC SCL	O	Cassette memory communication clock output terminal	7	3	FA	3
11	MIC SDA	I/O	Cassette memory communication data terminal	7	3	FA	2
12	CNVSS		GND				
13	XCIN	I	Sub clock input	7	3	FA	1
14	XCOU	O	Sub clock output	7	3	FA	0
15	RESET	I	Reset signal input				
16	XIN	I	Main clock input				
17	XOUT	O	Main clock output				
18	VSS		GND				
19	DC J DET	I	DC jack insertion detection (Detection by voltage)	7	3	F9	7
20	CAS IN	I	CASSETTE IN switch detection	7	3	F9	6
21	EJECT SW	I	EJECT switch detection	7	3	F9	5
22	LANC ON	I	LANC power ON detection	7	3	F9	4
23	LI3 DET	I	Detected power loss of lithium battery for backup	7	3	F9	3
24	MAIN SW2	I	Power switch detection	7	3	F9	2
25	MAIN SW1	I	Power switch detection	7	3	F9	1
26	MAIN SW0	I	Power switch detection	7	3	F9	0
27	VTR PW LED	O	VTR mode, POWER LED control	7	3	F8	7
28	CAM PW LED	O	Camera mode, POWER LED control	7	3	F8	6
29	TALLY LED	O	Tally LED control	7	3	F8	5
30	MIC ON	O	Cassette memory, power supply control	7	3	F8	4
31	EVF BL ON	O		7	3	F8	3
32	N.C	O		7	3	F8	2
33	N.C	O	Charger IC, serial data	7	3	F8	1
34	REC CTL	O	Recording current forcible OFF control	7	3	F8	0
35	F CH	I	Function check (for factory adjustment)	7	3	F7	
36	SERVICE M S	I	Main serial is not detected. (for factory adjustment)	7	3	F6	
37	MIC3	I	Cassette memory/ID board detection	7	3	F5	
38	MIC2	I	Cassette memory/ID board detection	7	3	F4	
39	MIC1	I	Cassette memory/ID board detection	7	3	F3	
40	-	I	Connect to GND	7	3	F2	
41	BATT INFO AD	I	Battery type detection	7	3	F1	
42	BATT AD	I	Battery low voltage detection	7	3	F0	
43	VCC		E3V + LI3V				
44	VREF		E3V				
45	AVSS		GND				
46	LCD ON	O	LCD ON/OFF Control	7	3	FC	7
47	LCD BL ON	O	LCD backlight control	7	3	FC	6
48	VTR ON	O	VTR power supply control	7	3	FC	5

## CHAPTER 3. INFORMATION FOR REPAIR · SERVICE HINTS

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## 1. List of Maintenance Tools and Supplies

### 1-1 List of Maintenance Tools

Item Name	Item Number	Purpose	Remarks
Alignment Tape, (Color bar master/NTSC)	DY9-1321-000	Recorder electrical adjustment	
Alignment Tape (tracking)	DY9-1345-000	Running adjustment	DMC II
Cassette Torque Gauge for DV	DY9-1346-000	Running adjustment	DMC II
Cleaning Tape (normal)	—	Commercially available	DMC II
DV Cleaning Tape (hard)	DY9-1359-000	Head cleaning	DMC II
Driver bit for tape path adjustment	DY9-2053-000	Tape path adjustment	DMC II
Color bar chart	DY9-2002-000	Camera electrical adjustment	
Color Viewer 5600 K for 100V	DY9-2039-100	Camera electrical adjustment (JPN)	
Color Viewer 5600 K for 115V	DY9-2039-115	Camera electrical adjustment (USA)	
Lamp for Color Viewer 5600K	DY9-2040-000	Replacement	
Filter, CCA W12ø46mm	DY9-2046-000	Camera electrical adjustment	
Remote Commander RM-95	DY9-1349-000	Service mode, electrical adjustment	
CZ/Siemens Chart	DY9-1372-000	CZ adjustment	*Same chart as the convention model's.

### 1-2 List of Supplies

Item Name	Item Number	Purpose	Remarks
Logenest Lambda A-74	CY9-8102-000	Lubrication	Lens
Grease GE-C9	CY9-8043-000	Lubrication	Lens
Grease GE-X8	CY9-8044-000	Lubrication	Lens
Hanarl KS -50	DY9-3047-000	Lubrication	Cover
Sponge (W×H×T : 300mm×200mm×6mm)	DY9-4001-000	General-purpose vibration isolating /sound absorbing material	
Adhesive Tape, No.354E (W×L×T : 9mm×50m×0.15mm, UL type)	DY9-3032-000	General-purpose adhesive tape	
Adhesive Tape, No. 501F (W×L×T : 10mm×50m×0.16mm, UL type)	DY9-3034-000	General-purpose double-side-coated adhesive tape	
Sheet, Shield (W×H : 250mm×250mm)	DY9-3036-000	General-purpose shield material	
Hanarl FL-778	DY9-3026-010	Lubrication	Cover
Floil C-1Z	DY9-3039-000	Lubrication	Cover
Dia Bond No. 1663	DY9-3009-000	Adhesive	
Tape Kapton	DY9-3052-000	General-purpose adhesive tape	

## 2. Settings

Perform the AF/EIS/ CAMERA adjustments in a complete-product state.

### 2-1 Recorder Adjustment Setting

#### <Purpose>

Check of each section, tape path adjustment, and recorder electrical adjustment are made with the front, rear, left and right cover units removed.

#### 2-1-1 Setting

#### <Procedures>

- 1) Solder the jumper wires (×2), TP2001 (PB-RF) and TP2002 (SWP) on the MAIN P.C.B.
- 2) Connect the cable of the Right Cover unit with the CN102 (R-KEY) and CN3201 (power supply).
- 3) To turn on the power, connect the cable of the Left Cover unit with the CN200 (P-DIAL).
- \*Connecting the TP203 and TP204 (MAIN P.C.B.) to ground can turn on the power also.
- 4) Operation by a LANC Remote Controller is possible by connecting the Docking Unit (DU-300) with the Multi Connector.
- 5) The power is supplyable via the DC-400 or connecting the Constant Voltage Supplier with the TP3201/3202 (DC+) and the TP3203/3204 (DC-).

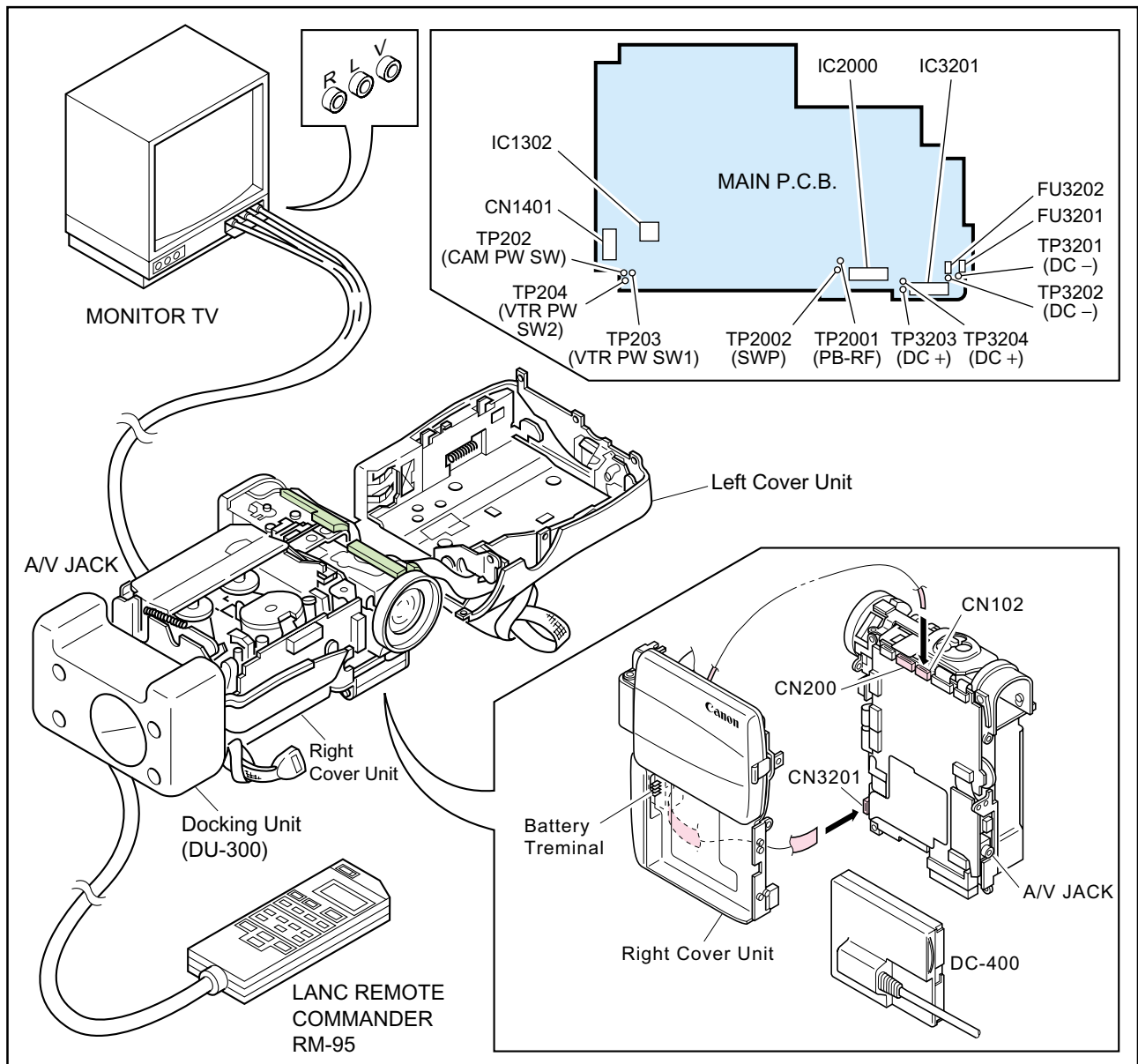


Fig. 3-1

### 3. How to Use Service Remote Controller (DY9-1349-000)

- (1) Connect the LANC terminal.
- (2) To set up the service mode, turn the HOLD SW to the HOLD position. When the HOLD SW is returned to its home position, the product is controlled using its own functions.
- (3) LCD indications in the service mode:
  - 4) PAGE is indicated while the FOCUS KEY is held down.
  - 5) BANK is indicated.
  - 6) MODE is indicated.  
WR when the BATT mark is presented.
  - 7) ADDR is indicated.
  - 8) DT is indicated (hexadecimal).
- (4) The following table shows the key functions available in the service mode.

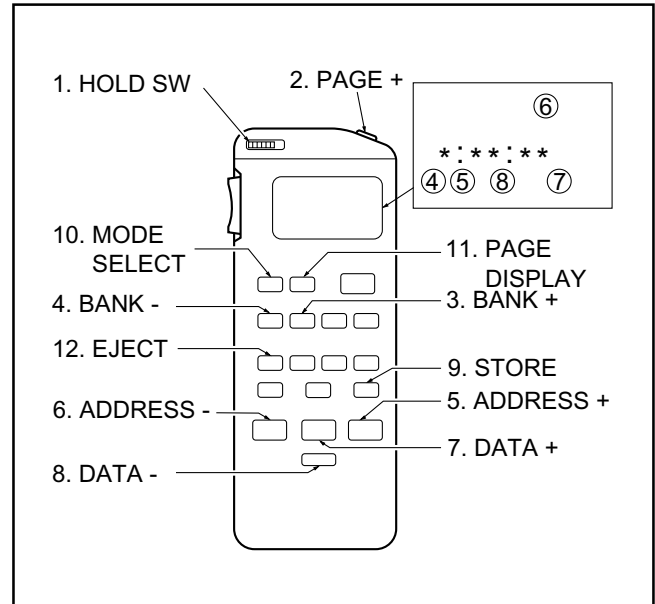


Fig. 3-2

#### < Key Functions in Service Mode >

No.	Key name (in service mode)	Function	Key name (in normal state)
1	HOLD	Transition to service mode by setting to the HOLD position	HOLD
2	PAGE +	PAGE is incremented by one.	START/STOP
3	BANK +	BANK is incremented by one.	EDIT SEARCH +
4	BANK -	BANK is decremented by one.	EDIT SEARCH -
5	ADDRESS +	ADDRESS is incremented by one.	FF
6	ADDRESS -	ADDRESS is decremented by one.	REW
7	DATA +	DATA is incremented by one.	PLAY
8	DATA -	DATA is decremented by one.	STOP
9	STORE	Confirmation/writing of DATA	PAUSE
10	MODE SELECT	RD/WR mode selection	REC REVIEW
11	PAGE DISPLAY	PAGE is indicated on LED of remote controller.	FOCUS
12	EJECT	EJECT operation is performed.	COUNTER RESET

## 4. Service Modes

### 4-1 General

- (1) The service modes are of a command input type using LANC communication.
- (2) In the command-input-type service mode, operation mode transition in the main unit can be performed using the keys equipped on it. Also, by returning the HOLD SW to the normal mode position, the operation mode transition on the main unit can be performed with the service remote controller.
- (3) In the command-input-type service mode, the mechanism error, dew, insufficiency of power and other safety detecting functions are ineffective.
- (4) In the command-input-type service mode, the LCD mirror function is ineffective.

### 4-2 Service Mode Indications

Shown below are the on-screen indications to be given in the service modes.

- 1) Indicates that the service mode is set up ("SERV").
- 2) Indicates which block is subjected to the command ("MAIN", "CAM", "SUB" microcomputer etc.).
- 3) Indicates a message for a special command ("DATA", "SUB" etc.).
- 4) PG : Indicates the PAGE being selected ("4" to "7").
- 5) BK : Indicates the BANK being selected ("0" to "7").
- 6) MD : Indicates the MODE being selected (RD/WR).
- 7) ADDR : Indicates the ADDRESS being selected in hexadecimal (\*\*00 to \*\*FF, 0000 to FFFF).
- 8) DT : Indicates the DATA being read or set in hexadecimal (00 to FF).
- 9) DT : Indicates the DATA being read or set in binary (\*\*\*\*\*), except for some special functions.
- 10) ST : Indicates the STATUS in progress ("OK", "NG", "BUSY" etc.).
- 11) Indicates an absolute track number.
- 12) E0 : Indicates an error rate on a track traced by the CH0 (low channel) head.
- 13) E1 : Indicates an error rate on a track traced by the CH1 (high channel) head.
- 14) Indicates a version number of the MAIN microcomputer.
- 15) Indicates a version number of the SUB microcomputer.
- 16) Indicates a version number of the CAMERA microcomputer.
- 17) Indicates a firmware version for Card control. (MC model only)

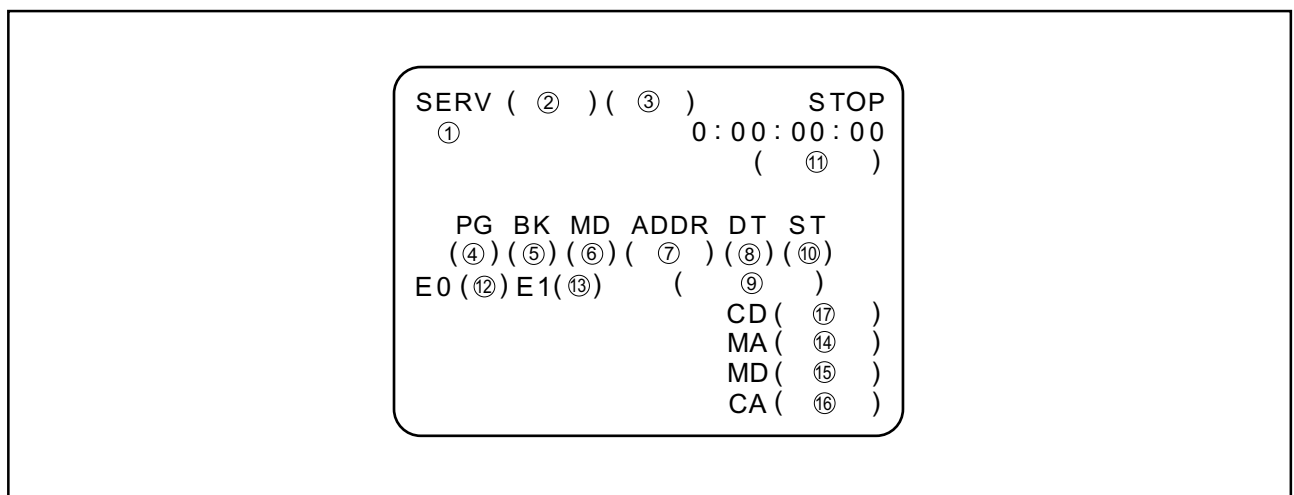


Fig. 3-3

## 5. Description of Service Modes

### 5-1 Error Rate

#### <Generals>

- (1) A VIDEO error rate (VIDEO + AUDIO) and an AUDIO error rate can be checked.
- (2) Note that the error rate is worsened on occurrence of failure in tape running, deterioration of tape, decreased in head output, failure in head amplifier, improper drum shield, etc.

#### <How to read a VIDEO error rate>

An average error rate on 64-track AUDIO+VIDEO sector is indicated in exponential representation.

Example) '15' is indicated:

$$\text{Error rate} = 1 \times 10^{-5}$$

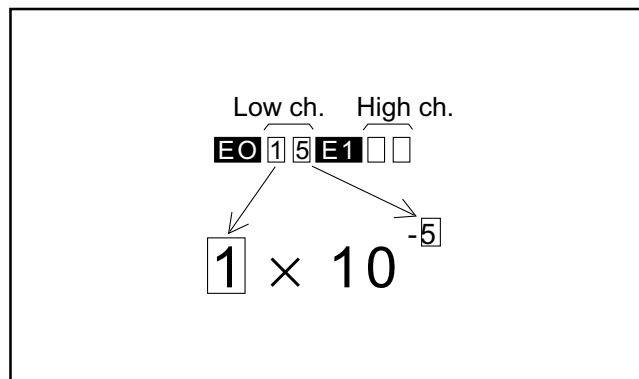


Fig. 3-4

#### <How to read an AUDIO error rate>

To read error rate of AUDIO track, follow the procedures in the table below.

The number of erroneous sync block of 64-track AUDIO sync blocks is indicated in two hexadecimal digits.

(FF limitation is imposed on a value exceeding 255.)

Example) '23' is indicated:

Number of erroneous sync blocks = 35

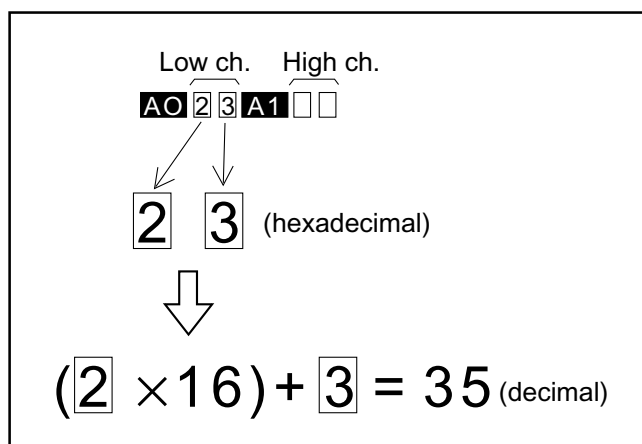


Fig. 3-5

In the product specifications, the error rate on both channels in self-recording LP playback is as follows :

Error rate = 28H or less

(Number of erroneous sync blocks = 40 or less)

#### Important

After the adjustment, set the DT to the product setting . (press STORE key at 1 of STEP 1 state.)

STEP	PROCEDURE ERROR RATE	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make setting shown at right.	6	4	WR	--1D	00		Product setting
	2) Set DT to 03.	↑	↑	↑	↑	03		Audio error rate indication
	Reference) Product setting can be selected by resetting DT to 00. Thus, the Audio+Video error rate is indicated.							

## 5-2 Mechanical Error Indications

### <Generals>

- (1) When the camcorder is stopped upon detection of a mechanical error, the POWER LED indicator blinks and the message "EJECT CASSETTE" appears on screen. At this step, the error condition can be checked in the service mode.
- (2) A mechanical error indication is given in either one of the following two manners: indication of data held only by the main battery, and indication of data backed up by the Lithium 3V. Referring to the table shown below, select an indication mode.
- (3) Data backed up by the Lithium 3V can be reset at step 3.

STEP	PROCEDURE MECH. ERROR	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make setting shown at right.	7	2	RD	--01	--		Error data held only in the POWER-ON state is indicated.
2	1) Make setting shown at right.	7	2	RD	--02	--		Error data backed up by the EEPROM is indicated.
3	1) Make setting shown at right. 2) Press the STORE key.	7 ↑	2 ↑	WR RD	--02 ↑	00 ↑	*	Completion of backup data resetting

### <Indication of error data held only by the main battery>

PG BK MD ADDR DT ST

7 2 RD --01 --

EBDCSTLD

Relevant error indication is highlighted.

E:TAPE END  
B:TAPE TOP  
D:DRUM ERROR  
C:CAPSTAN ERROR  
S:S-REEL ERROR  
T:T-REEL ERROR  
L:LOADING MTR ERROR  
D:DEW ERROR

Fig. 3-6

### <Indication of error data backed up by Lithium 3V>

PG BK MD ADDR DT ST

7 2 RD --02 --

\*\*DCSTLD

Relevant error indication is highlighted.

D:DRUM ERROR  
C:CAPSTAN ERROR  
S:S-REEL ERROR  
T:T-REEL ERROR  
L:LOADING MTR ERROR  
D:DEW ERROR

Fig. 3-7



### 5-3 Camera Special Commands

#### <Generals>

- (1) The camera special commands are available for operation check.
- (2) Referring to the table shown below, make preparation, and then use any camera special commands as required.
- (3) All the settings are reset when the STORE key is pressed in the “WR” mode at a relevant item.

Also, all commands are reset by turning the power off and on again.

STEP	PROCEDURE CAM SPECIAL COMMAND	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
Preparation	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	3 ↑	WR RD	**00 ↑	33 ↑	WAIT OK	Completion of high address "33" setting
WB SET	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3300 ↑	-- --	WAIT OK	WB is set.
WB LOCK	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3301 ↑	-- --	WAIT OK	WB is locked.
WB TURBO	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3302 ↑	-- --	WAIT OK	WB high-speed setting mode
WB OUTDOOR	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3303 ↑	-- --	WAIT OK	Outdoor white balance mode
WB INDOOR	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3304 ↑	-- --	WAIT OK	Indoor white balance mode
IRIS OPEN	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3305 ↑	-- --	WAIT OK	The iris is opened forcibly.
IRIS CLOSE	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3306 ↑	-- --	WAIT OK	The iris is closed forcibly.
AGC MAX	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3307 ↑	-- --	WAIT OK	A value of AGC gain is maximized.
AGC MIN	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3308 ↑	-- --	WAIT OK	A value of AGC gain is minimized.
COLOR BAR	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3309 ↑	-- --	WAIT OK	Output a color bar signal for DIC output.
White 100% (DIC)	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	330A ↑	-- --	WAIT OK	Output a white 100% signal for FIC output.
White 50% (DIC)	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	330B ↑	-- --	WAIT OK	Output a white 50% signal for DIC output.
White, arbitrary (DIC)	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	330C ↑	-- --	WAIT OK	DIC output, white (By charging the DT of "PG : 5, BK : 0, AD : 2822", the brightness can be changed arbitrary.
White 100% (FIC)	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	330D ↑	-- --	WAIT OK	Output a white 100% signal for FIC output.
White 50% (FIC)	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	330E ↑	-- --	WAIT OK	Output a white 50% signal for FIC output.
White, arbitrary (FIC)	1) Make setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	330F ↑	-- --	WAIT OK	FIC output, white (By charging the DT of "PG : 5, BK : 0, AD : 2822", the brightness can be changed arbitrary.

## 5-4 Checking the Lens Resetting

### <Generals>

- (1) Setting the address according to the table below allows to check whether the lens resetting is ended or not.
- (2) The 1st digit of binary number indication (Fig. 3-3 ⑨) of data is for zoom, and the 2nd for focus resetting. Resetting is ended if 1 is indicated.

STEP	PROCEDURE	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
PREPARATION	1) Make setting shown at right.	5	1	WR	**00	31	WAIT	Completion of high address"31" setting
	2) Press the STORE key.	↑	↑	RD	↑	↑	OK	
LENS RESET	Set to status shown on right and check the binary number indication data.	5	0	RD	313F	--	WAIT	

## 5-5 Functional Check of Control Keys and Switches

### <Generals>

- (1) In the service mode, the terminals of the MAIN and SUB microcomputer can be checked. Thereby, it is allowed to check key-related operations and key-microcomputer connections in the product state.
- (2) The addresses of the microcomputer terminals for checking are indicated in the "Remarks" column in the I/O port table (p. 2-14 to p. 2-21). Note that since serial communication data signals are not synchronous with the LANC communication cycle (field) in the service mode, operations related to these signals are not indicated accurately. So, use indications for these signals just as reference data.
- (3) The following explanations are provided for the data content which seem rather complicated. For other than below, use the addresses shown in the "Remarks" column of the I/O port table.
- (4) When carrying out functional checks, select the RD mode.

### 5-5-1 Voltage Range for A/D Input Key

- (1) On the MAIN and SUB microcomputers, the terminals shown in Fig. 3-8 are A/D input ports. Key and/or mode is detected by means of the A/D-converted voltage.

MI-COM	Pin No.	NAME	PG	BK	ADDR	A/D DATA(00~FF)						
MAIN	193	MSW AD	7	2	CA	(00~36) LOAD1	(37~64) STBY	(65~87) POP UP	(88~A2) PLAY	(A3~BA) STOP	(BB~E3) LOAD2	(E4~FF) GAP
MAIN	183	DEW DET	7	2	C0	(00~12) DEW RELEASE	(16~FF) DEW DET					
MAIN	184	KEY A/D 0	7	2	C1	(00~2C) STOP	(2D~67) REW	(68~A7) REC PAUSE	(A8~FF) --			
MAIN	185	KEY A/D 1	7	2	C2	PLAY	FF	DE.ON/OFF	--			
MAIN	186	KEY A/D 2	7	2	C3	MENU	EXP	FOCOS	--			
MAIN	187	KEY A/D 3	7	2	C4	EXECUTE	--	--				
SUB	41	BATT. INFO A/D	7	3	F1	(00~33) Without battery	(34~65) --	(66~99) BP-422	(9A~FF) BP-406			
SUB	42	BATT A/D	7	3	F0	Voltage of main power supply						

Fig. 3-8

## 6. Service Hints

### 6-1 Arrangement of Circuit Boards

The printed circuit boards are arranged as shown below.

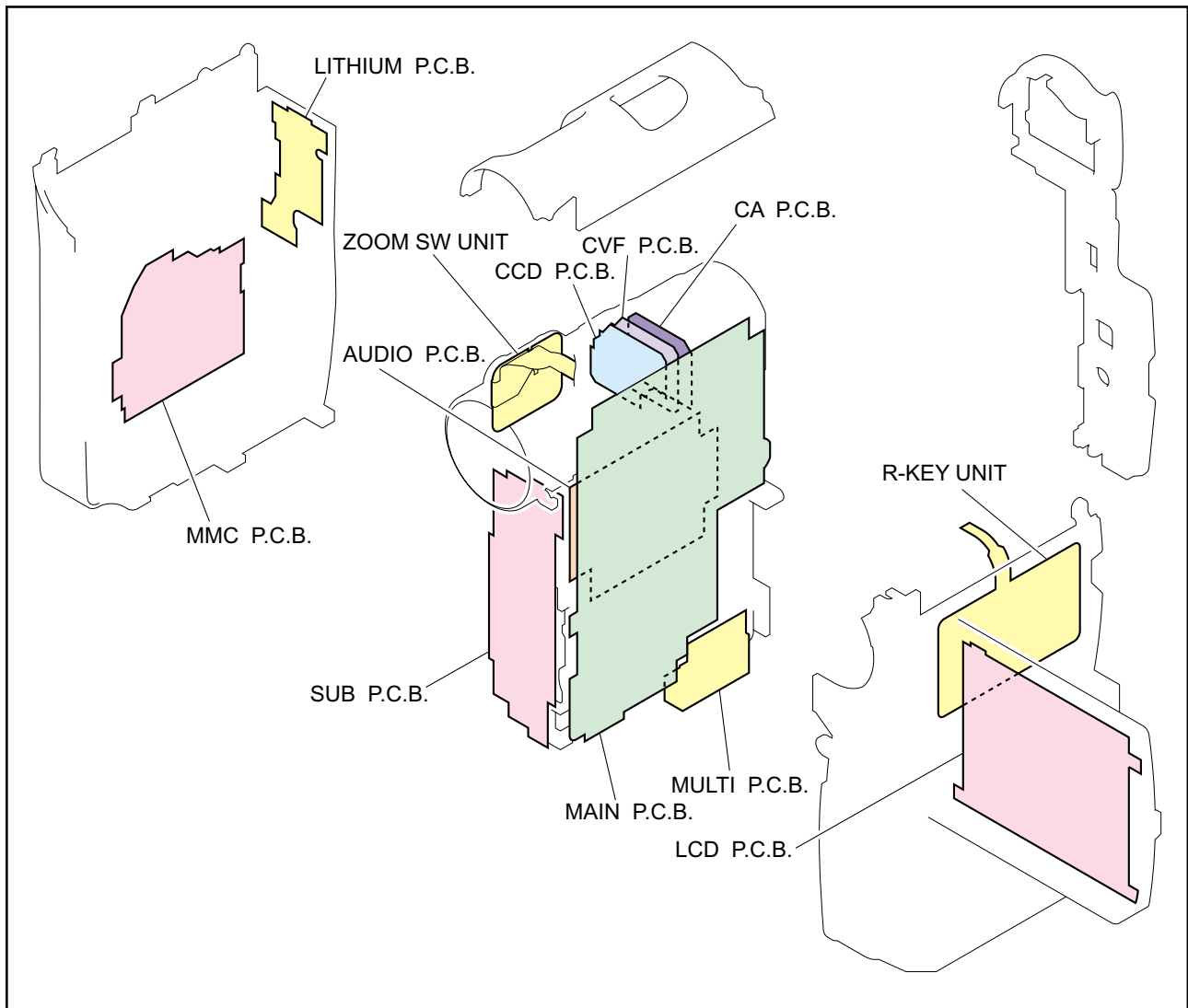


Fig.3-9

### 6-2 Current Consumption Check

The following table shows the specified value of current consumption in each status.

Measurement condition : Product status, camera auto mode(AF,IS OFF), LCD ON (0.1A each smaller in case of CVF)  
Preset voltage : 7.4V

\* : MC model only

POWER SW	MODE	Current Consumption (A)	POWER SW	MODE	Current Consumption (A)
CAMERA	REC PAUSE	0.65	VTR	STILL	0.50
	REC	0.72		FF/REW	0.70
	STOP	0.63		CUE/REV	0.61
VTR	STOP	0.46	CARD REC *		0.70
	PLAY	0.57	CARD PLAY *		0.47

## 7. Trouble Shooting

To detect the failure part for repair, if any, use the following hints and check points.

### 7-1 Power Supply

#### <Hints>

When the power source is attached, the unit enters the standby mode in the following sequences.

Power source inserted → POWER UNREG is supplied to MAIN P.C.B. → SUB microcomputer is activated. → SUB microcomputer activates recorder power supply. → SUB microcomputer communicates with MAIN microcomputer. → MAIN microcomputer initializes the mechanisms. → After initialization, SUB microcomputer turns OFF recorder power supply. → Standby mode is set.

Then, the power is turned on in the following sequences.

Power mode switch operated → After received at SUB microcomputer, VTR or CAM ON “H” signal is output. → PWM driver is activated to turn on each power supply. → Each microcomputer (SUB, MAIN, CAMERA) is started up to carry out system control.

#### <Check Points>

- 1) Key Inputs  
Check the key inputs at Power Switch in the SERVICE mode.
- 2) Check of microcomputer-to-microcomputer communication  
If the microcomputer-to-microcomputer communication line is normal, the version number of each microcomputer can be indicated in the service mode. Otherwise, the communication line or microcomputer may be faulty.
- 3) Error in Mechanism (P. 3-6)  
If any error is occurred by mechanism trouble at initializing, the error can be detected.  
At this state, the power can be turned on, but the unit enters “ERROR STOP” state. In this case, check the error data in the SERVICE mode.
- 4) VTR ON “H” (control signal from SUB microcomputer) Outputs  
Check the output of control signal by the LANC remote controller.
- 5) Fuses on the POWER SUPPLY P.C.B.  
Check the continuations of fuses FU 3201,3202 on MAIN P.C.B. If any fuse is faulty, replace it and check the current consumption.
- 6) Replace the MAIN P.C.B. with a service part and check the operation.

## 7-2 Camera Picture Faulty

### <Hints>

A flow of camera picture (EE) is as below.

CCD → CA P.C.B. → MAIN P.C.B. (DIC4 → SIC → VIC2→VIF2) → JACK P.C.B.

### <Check Points>

- 1) Lens Resetting (P. 3-8)  
If the camera picture is not displayed, check it in the service mode. If NG, check the lens.
- 2) Blue Back Output  
In the VCR mode, the blue-back signal is generated by the VIC2 mounted on the MAIN P.C.B. Therefore, if its normal output can be confirmed, it can be judged that the signal line subsequent to the VIC2 are normal.
- 3) Check of white 100% or color bar (DIC 4) output (P. 3-7)  
The white 100% or color bar (DIC 4) signal is generated by the DIC4 mounted on the MAIN P.C.B. In the service mode, check whether the white 100% or color bar signal is generated normally or not. If its output is normal, the signal line subsequent to the DIC4 would be normal.
- 4) CCD Output  
The CCD output signal is sampled by the CDS/AGC/AD IC. Check this signal condition.
- 5) Camera Special Command (P. 3-7)  
Check the operations of White Balance, AGC, IRIS, etc. in the SERVICE mode.

## 7-3 Faulty of Playback Picture

### <Hints>

In DV format, the deterioration of picture quality appears on the screen as a block noise. This failure is occurred when the picture information (in block unit) exceeds a limit of processing performance of error correction and the previous picture information is used for compensation.

Normally, if an error rate is worsened considerably by the deterioration of tape quality or head output, the symptom appears.

For this reason, when you check the playback picture, check the error rate. To evaluate the error rate at an absolute value, use several kinds of tapes.

### <Check Points>

- 1) Deterioration of Tape Quality  
Check if flaws, kinks, etc. are found on a magnetic face of tape or not, and compare it with the error rate of other unit.
- 2) Error Rate (P. 3-5)  
Check an error rate of self-recording LP playbaced picture in the SERVICE mode.  
If the result is “NG” check the following points.
- 3) Head Output (See the DMC II Service Manual.)  
Referring to a service manual of DMC II, check the RF output level and linearity. (including a cleaning of head)  
The relation between the RF envelope and the faulty symptom is as below.
  - Lack of output at inlet side : abnormal sound, left part of screen has a block noise.
  - Lack of output at outlet side : abnormal time code, etc., right part of screen has a block noise.
- 4) EQ Automatic Adjustment (P. 4-36)  
Referring to the adjustment procedures, perform the EQ automatic adjustment. By this adjustment, the Playback Amplifier circuit in the VRP2 (on the MAIN P.C.B.) and the playback RF output are matched so that the error rate is minimized automatically.

# CHAPTER 4. DISASSEMBLING ADJUSTMENT

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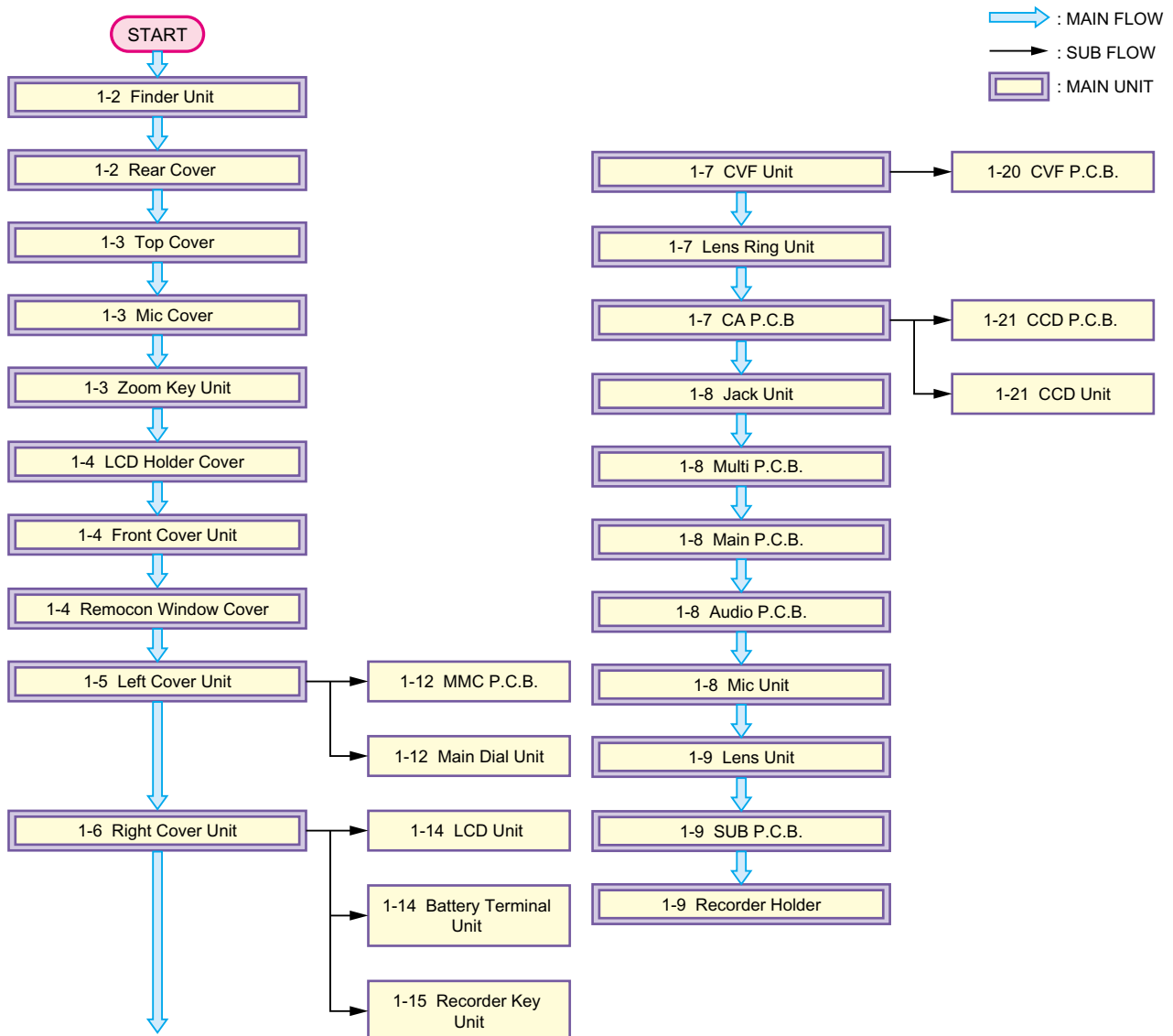
## 1. Disassembling and Reassembling

### Notes :

- (1) When replacing the flat cable with a new one, allow it to remain folded the same as the original part.
- (2) The flat cable has a contact orientation to be engaged with the connector. Refer to the instructions in the disassembly procedure diagram and interconnection diagram for boards.
  - Lateral engaging connector  
(The instructions are given in the disassembly procedure diagram and board interconnection diagram.)
    - ★ : Contacts are positioned downward. (board side)
    - \* : Contacts are positioned upward.
  - Lengthwise engaging connector  
(The instructions are given only in the boards interconnection diagram.)  
Indicated by →. Arrowheads indicate the contacts, and the shafts indicate the noncontacts.
- (3) To secure screws, apply the Three Bond 1401B (CY9-8012-000)

### 1-1 Disassembling / Reassembling Flowchart

- (1) Find the replacement part on the chart, and disassemble it following the instruction on chart.
- (2) Reassembling can be made by reversing the disassembling procedures.





## 1-2 Separation of Finder Unit & Rear Cover

- (1) Push the Lever and detach the Finder Unit.
- (2) Open the LCD Unit and Cassette Cover.
- (3) Remove five screws (a  $\times$  2, b  $\times$  1, c  $\times$  1, d  $\times$  1) and detach the Rear Cover.
- (4) Separate the AV cover from the Rear Cover.

### < Instruction for Supply >

Finder section : Hanal FL778 (DY9-3026-000)

Shaft and spring parts: Hanal FL778 (DY9-3026-000)

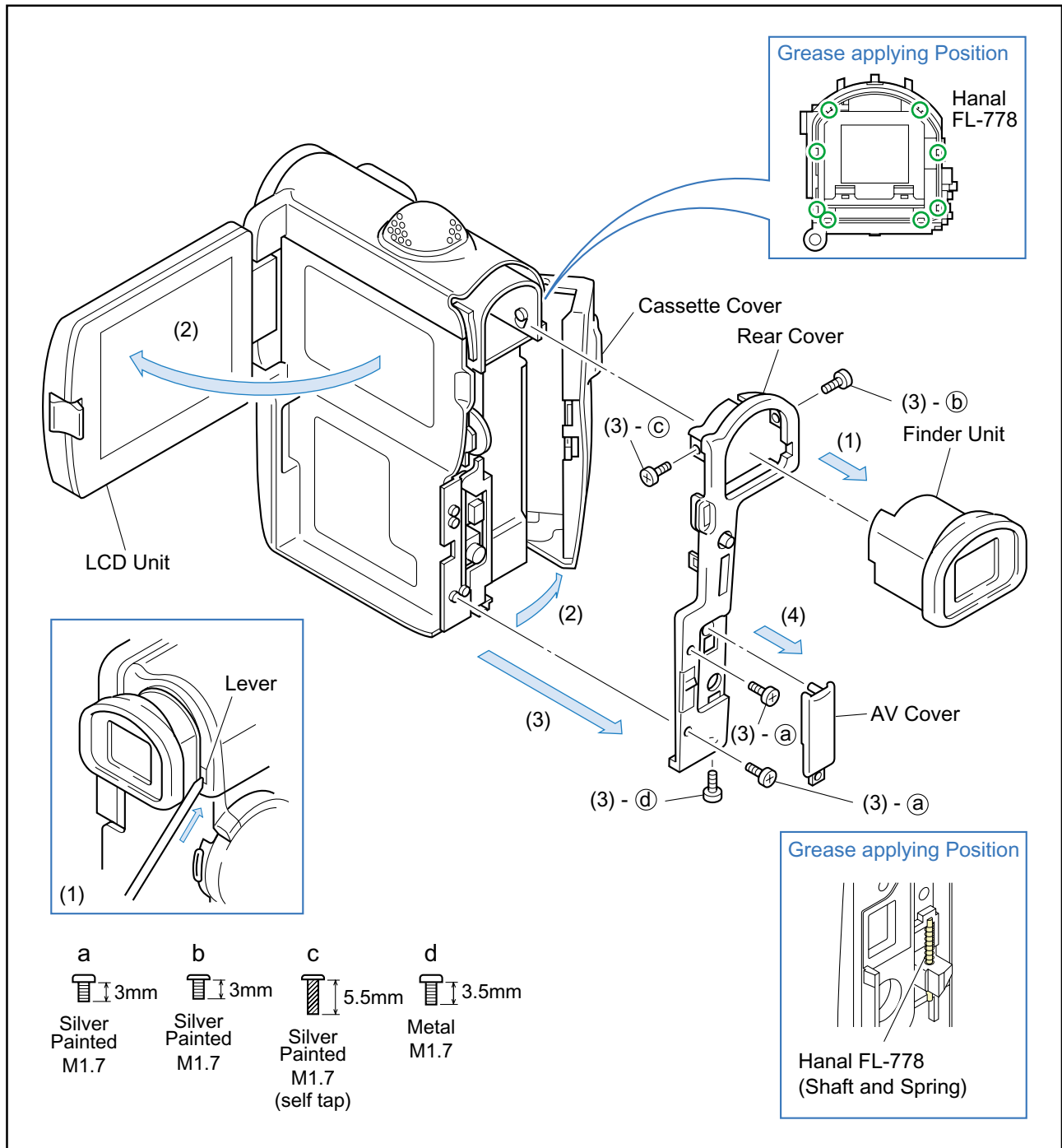


Fig. 4-1

### 1-3 Separation of Top Cover, Mic Cover and Zoom Key Unit

- (1) Remove two screws (b × 1, e × 1).
- (2) Detach the Top Cover, Mic Cover and Mic Sheet.
- (3) Remove CN1401 and two screws (f × 2), then detach the Zoom Key Unit.

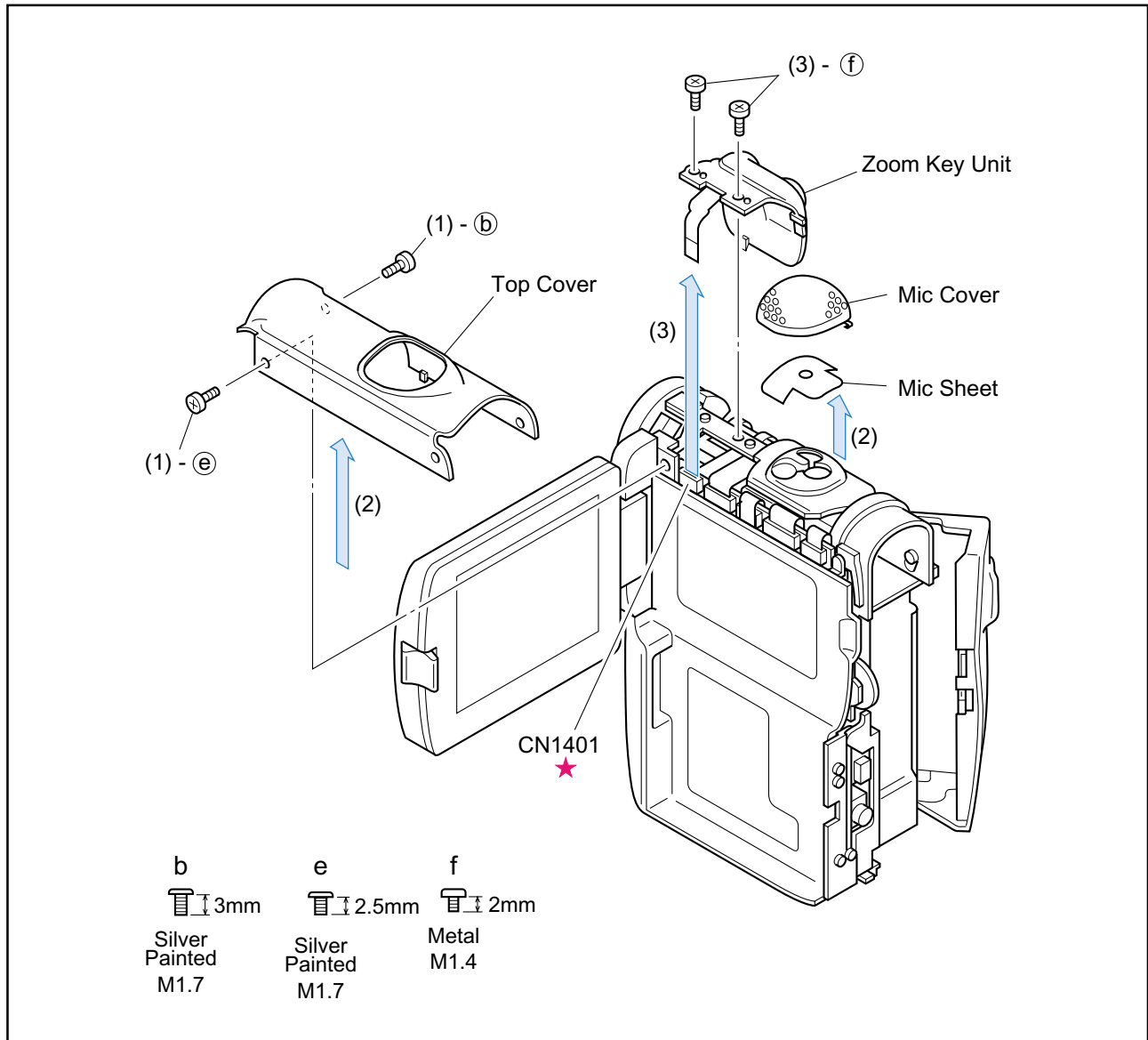


Fig. 4-2

## 1-4 Separation of LCD Holder Cover, Front Cover Unit and Remote Control Window Cover

- (1) Remove two screws (g × 2), and detach the upper and lower LCD Holder Covers and Front Cover Unit. Since the magnets are attached to the LCD Holder Covers, be careful about the polarity when reassembling.
- (2) Remove the Remote Control Window Cover.

### < Note on Reassembling >

- (1) When attaching the magnets on the LCD Holder Covers with an adhesive, face the red-painted sides (N) down.

### < Instruction for Supply >

Adhesion of magnet : DIA BOND No. 1663 (DY9-3009-000)

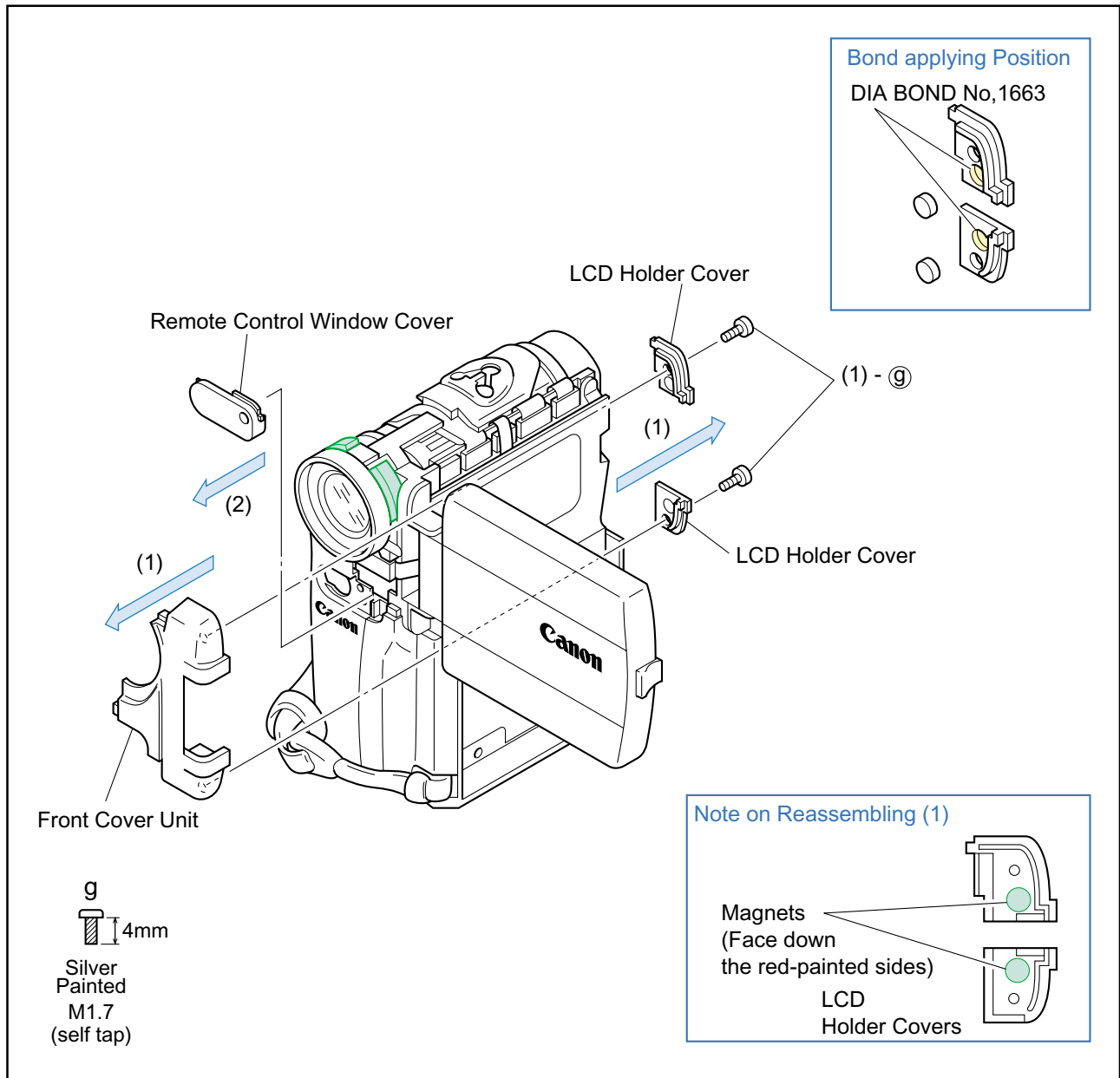


Fig. 4-3

### 1-5 Separation of Left Cover Unit

- (1) Detach the Hand Strap.
- (2) Remove four screws (d  $\times$  1, j  $\times$  1, k  $\times$  2).
- (3) Detach CN200, and with the Cassette Cover opened, remove the Left Cover Unit.

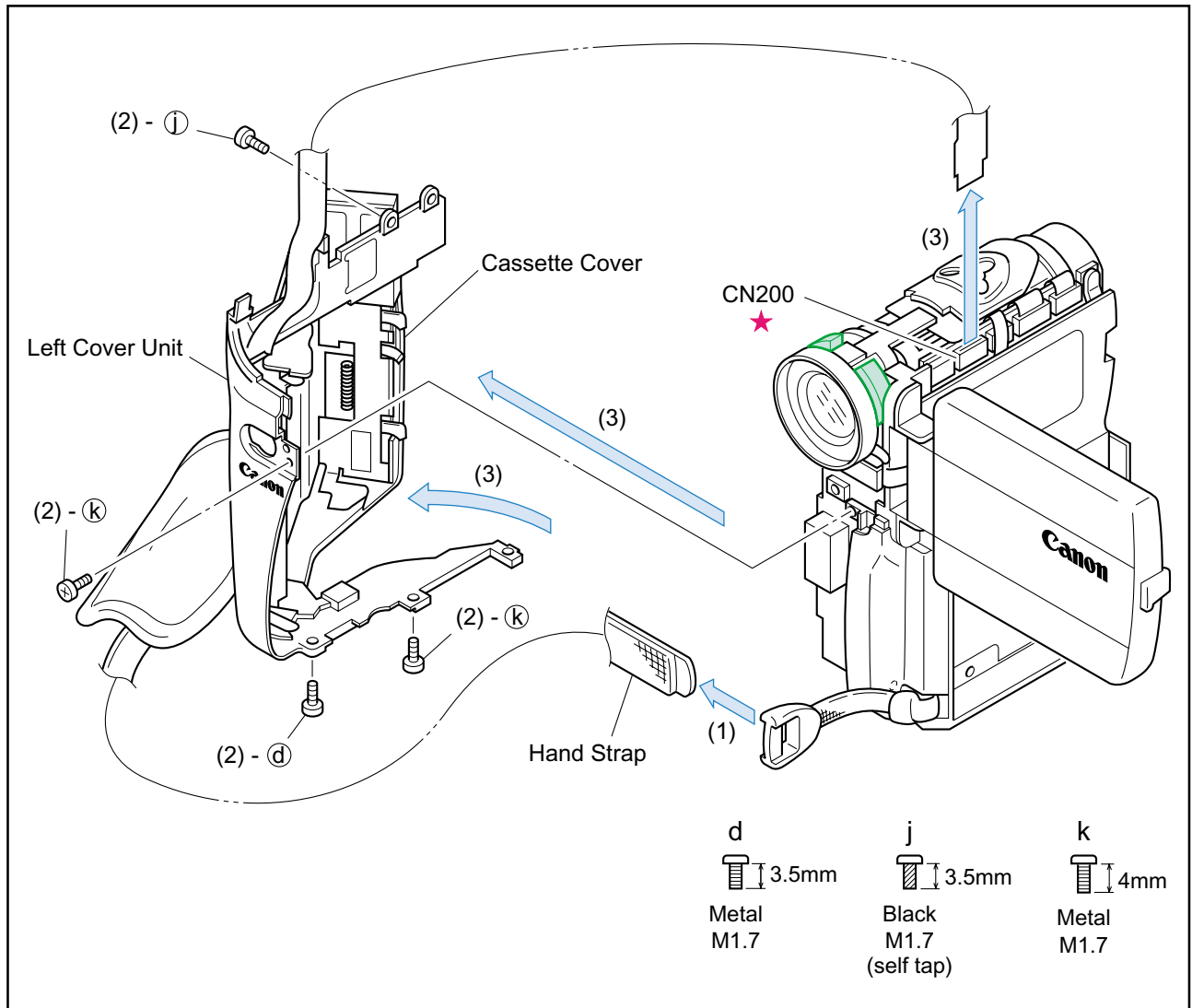


Fig. 4-4



## 1-7 Separation of CVF Unit, Lens Ring Unit and CA P.C.B.

- (1) Peel off the cushions, let the Mic Unit float above the CVF Unit, then remove two screws ( $h \times 1, m \times 1$ ) and CN1501, and detach the CVF Unit.
- (2) Detach two screws ( $n \times 2$ ) and remove the Lens Ring Unit.
- (3) Remove CN1402, and while detaching CN1000 and CN1001 (B to B), remove the CA P.C.B.

### < Note on Reassembling >

- (1) Be sure to attach the Cushions on the specified positions.

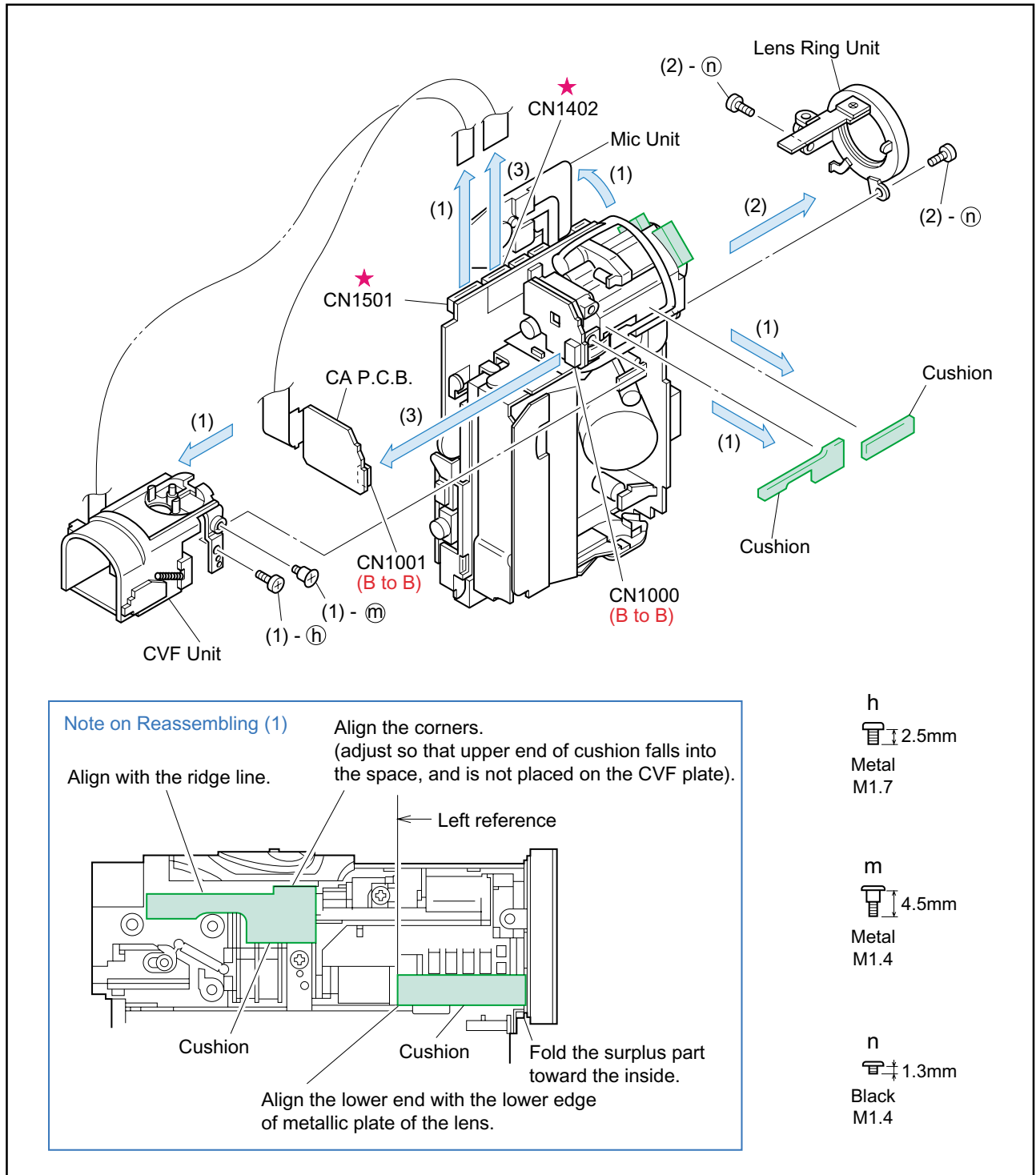


Fig. 4-6

## 1-8 Separation of Jack Unit, Multi P.C.B., Main P.C.B., Audio P.C.B. and Mic Unit

- (1) Detach two screws ( $h \times 2$ ) and CN3302 and CN93, then detach the Jack Unit.
- (2) Detach two screws ( $h \times 1$ ,  $i \times 1$ ) and CN92, then remove the Multi P.C.B.
- (3) Remove three screws ( $h \times 3$ ) and CN304, CN1301 (B to B), CN2000 and UL tape, and detach the Main P.C.B., Audio P.C.B. and Mic Unit together.
- (4) Remove CN601 and CN3301 (B to B), and separate the Audio P.C.B. and Mic Unit from the Main P.C.B.

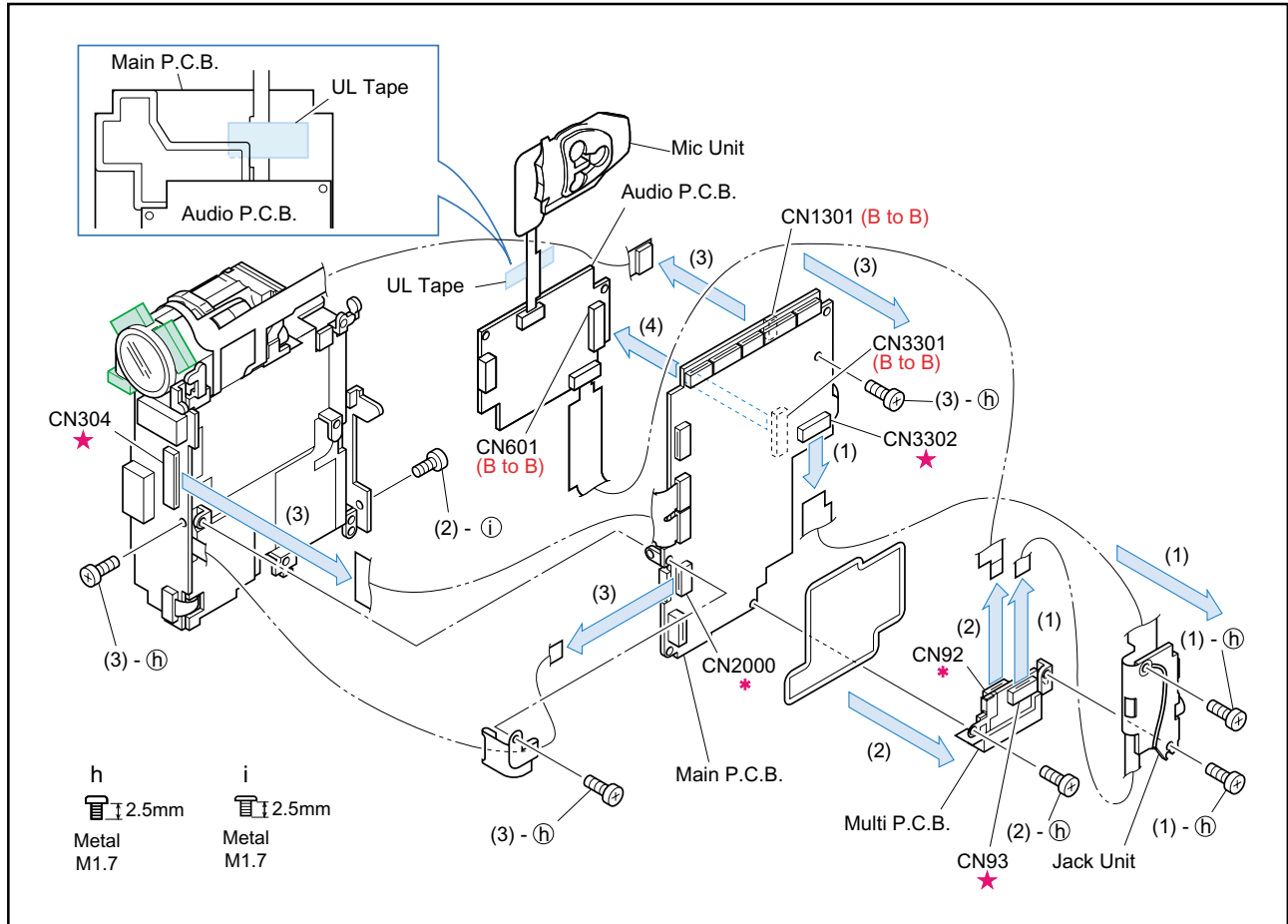


Fig. 4-7

## 1-9 Separation of Lens Unit, SUB P.C.B. and Recorder Holder

- (1) Detach two screws (m × 2) then remove the Lens Unit and Lens Sheet.
- (2) Detach two screws (h × 2) and CN300, CN301, CN302, CN303, and remove the SUB P.C.B.
- (3) Detach three screws (p × 2, q × 1) and the Spring, then remove the Recorder Holder.

**Note :** Be sure to face downward the cassette compartment side of the DMCII mechanism unit, from which the recorder holder has been detached. (Facing the gear at the rear of main chassis downward may result in damage to it.)

### < Note on Reassembling >

- (1) When attaching the Recorder Holder, note that there should be Rubber pieces at five locations.
- (2) Before using the Insulation Rubber of service parts, coat the entire surface with Hanal KS-50M (DY9-3047-000).

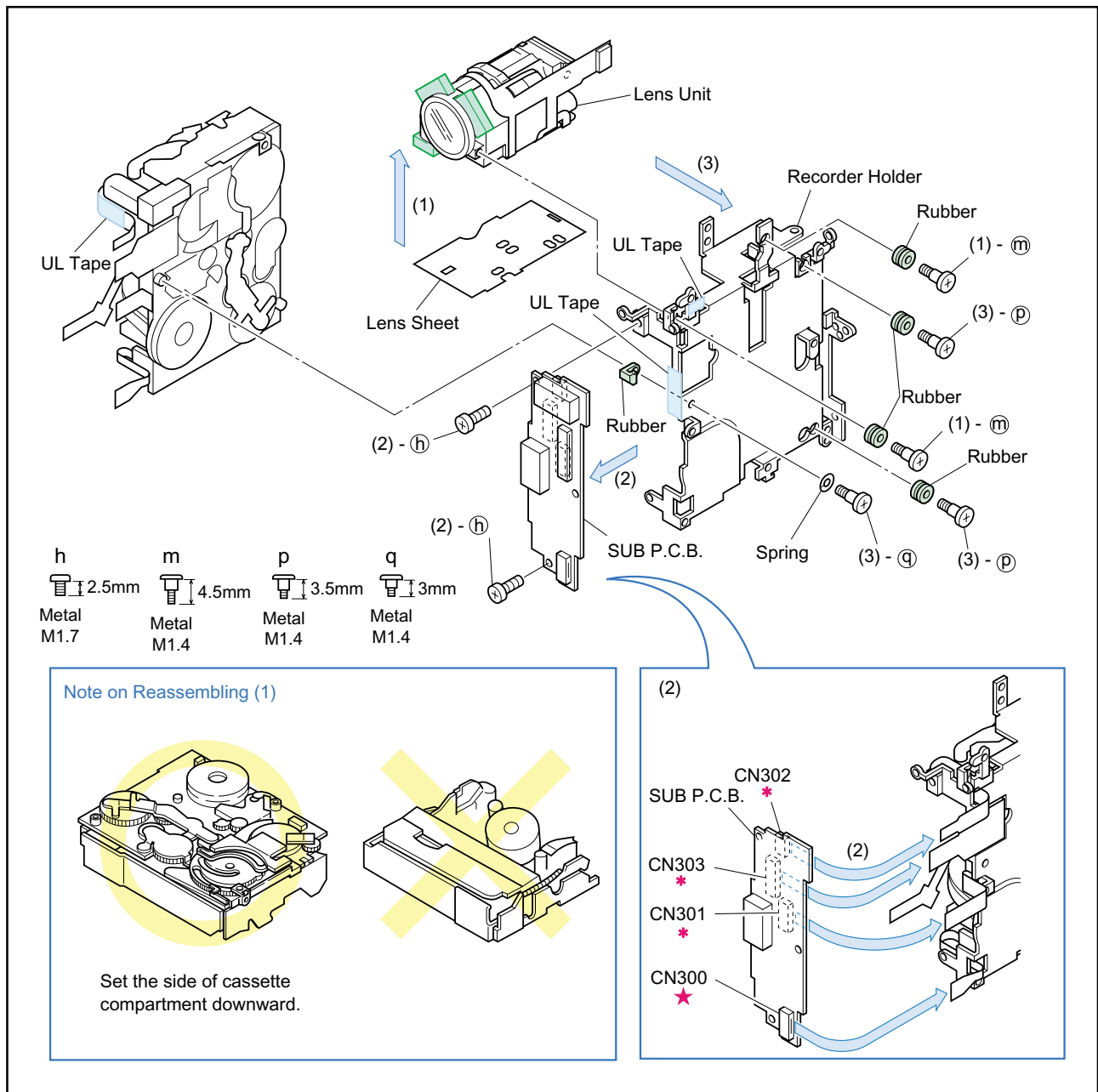


Fig. 4-8



## 1-10 Disassembly of Left Cover Unit 1

- (1) Open the MMC Cover, detach four screws (i × 1, r × 1, s × 2) and remove the C Cover.
- (2) Remove one screw (t × 1) then detach Spring Plate, Dial Plate and Switch Knob.
- (3) Remove two screws (d × 1, u × 1) and detach MMC Cover Unit. (ELURA20 MC A) or SD Cover Holder (ELURA10 A)

### < Note on Reassembling >

- (1) Secure the screws of C Cover in order.

### < Instruction for Supply >

Spring Plate : Hanal KS-50

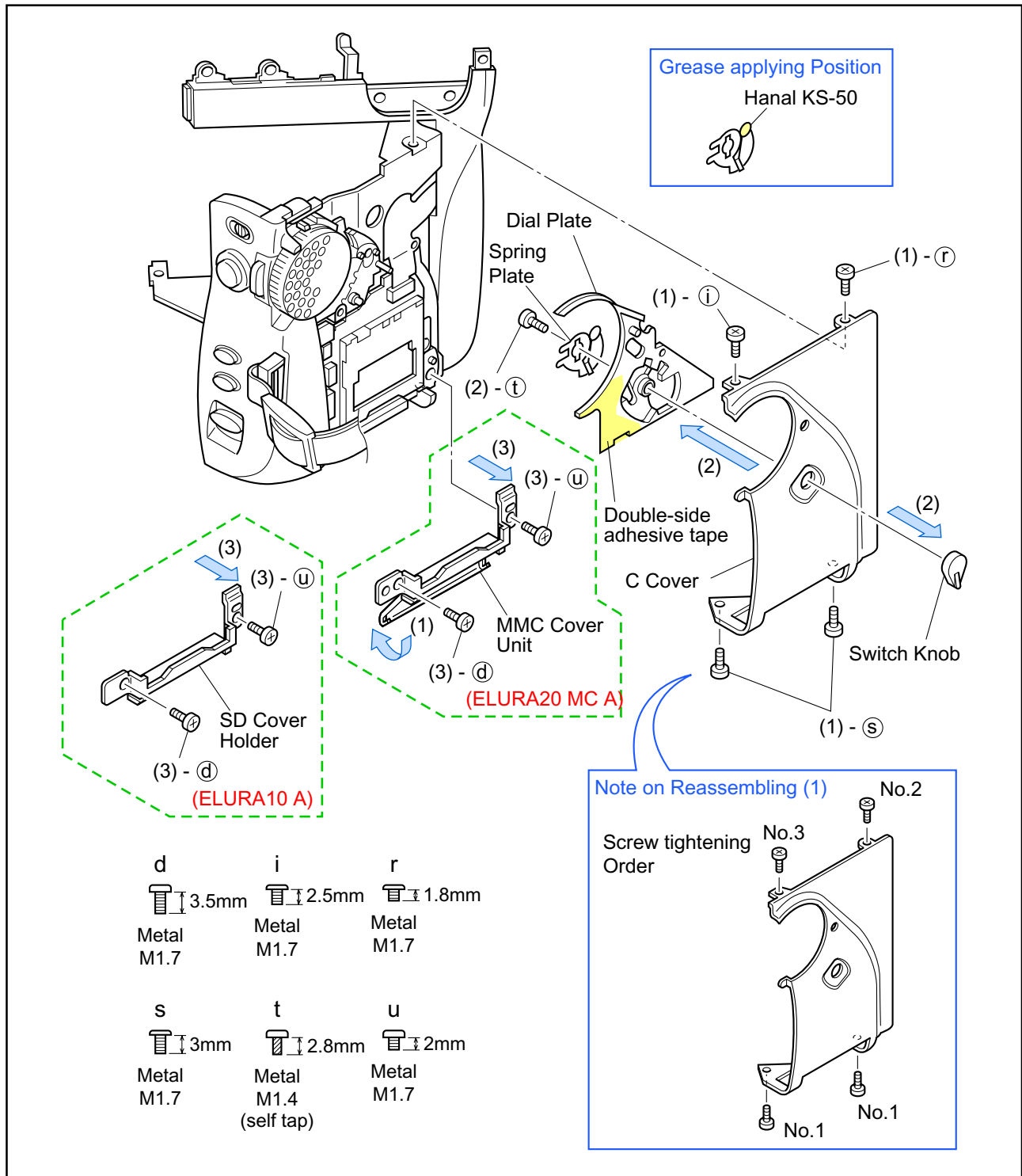


Fig. 4-9

## 1-11 Disassembly of Left Cover Unit 2

- (1) Remove the Hand Strap.
- (2) Detach six screws (u × 2, v × 1, w × 1, h × 2) and CN14, then remove the Cassette Rear Cover.

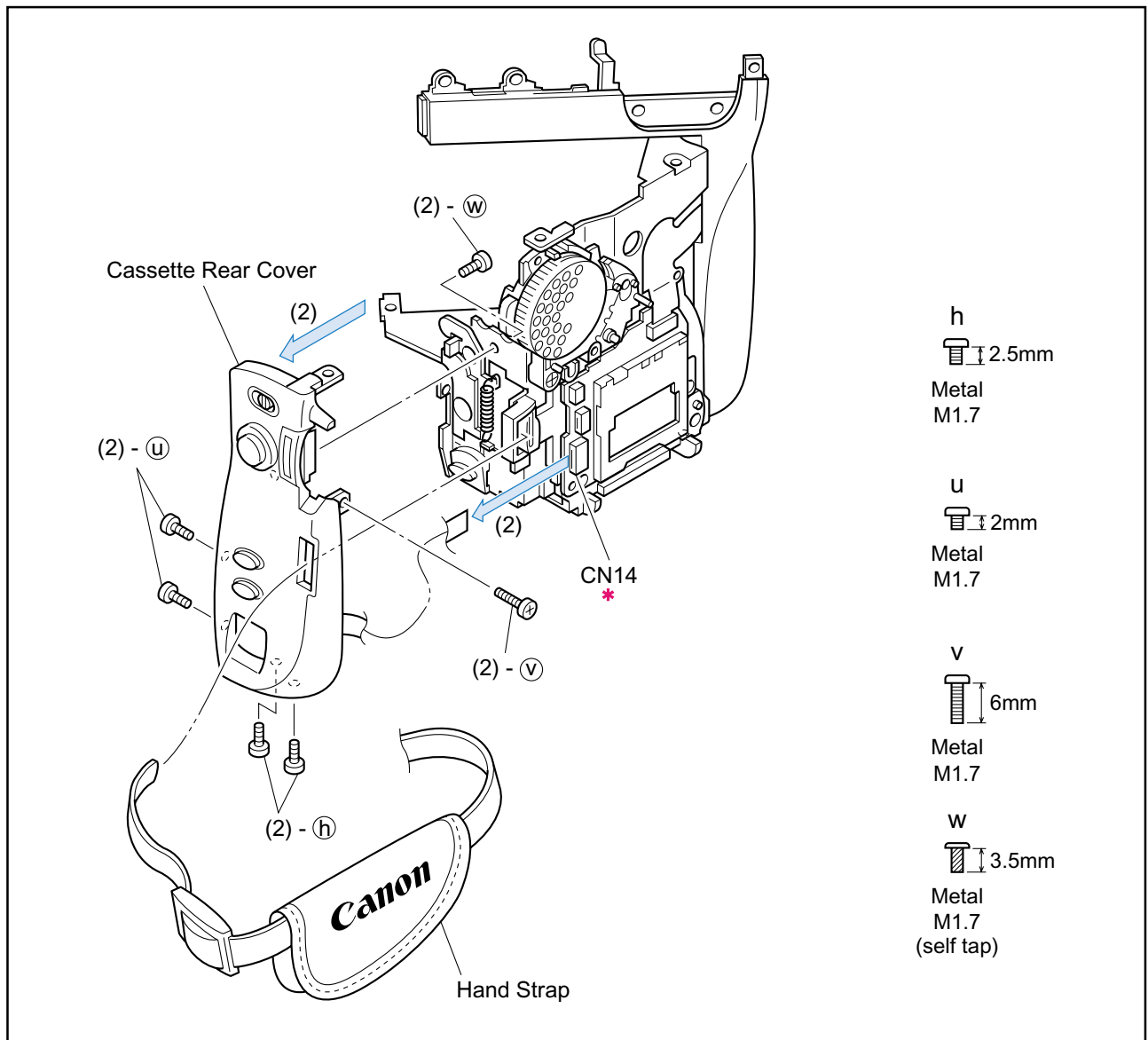


Fig. 4-10

### 1-12 Disassembly of Left Cover Unit 3

- (1) Detach CN11, CN13, CN15 and then MMC P.C.B.
- (2) Detach one screw ( $h \times 1$ ) and then the Main Dial Unit.

**< Note on Reassembling >**

- (1) The speaker wiring at the rear of Main Dial Unit should be run through the A part (in Fig. 4-11) for connection.

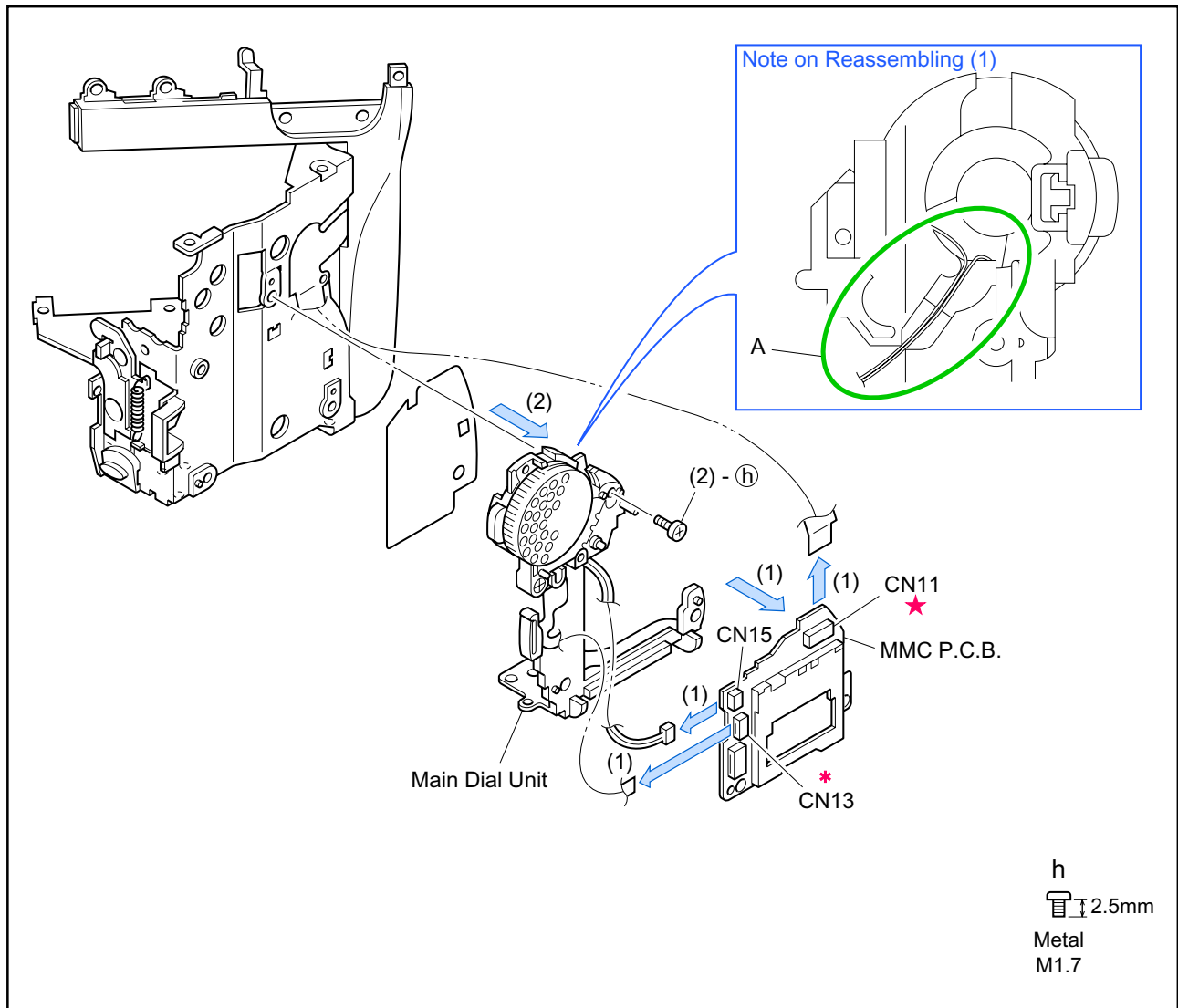


Fig. 4-11

### 1-13 Disassembly of Left Cover Unit 4

(1) Peel off the Caution Seal, remove five screws (i × 1, l × 2, r × 1, C × 1), and separate the Left Cover and Cassette Arm Unit.

< Note on Reassembling >

(1) Fold the FPC as shown in the figure when connecting it.

< Instruction for Supply >

Arm guide assembly in Cassette Arm Unit : FLOIL C-1Z

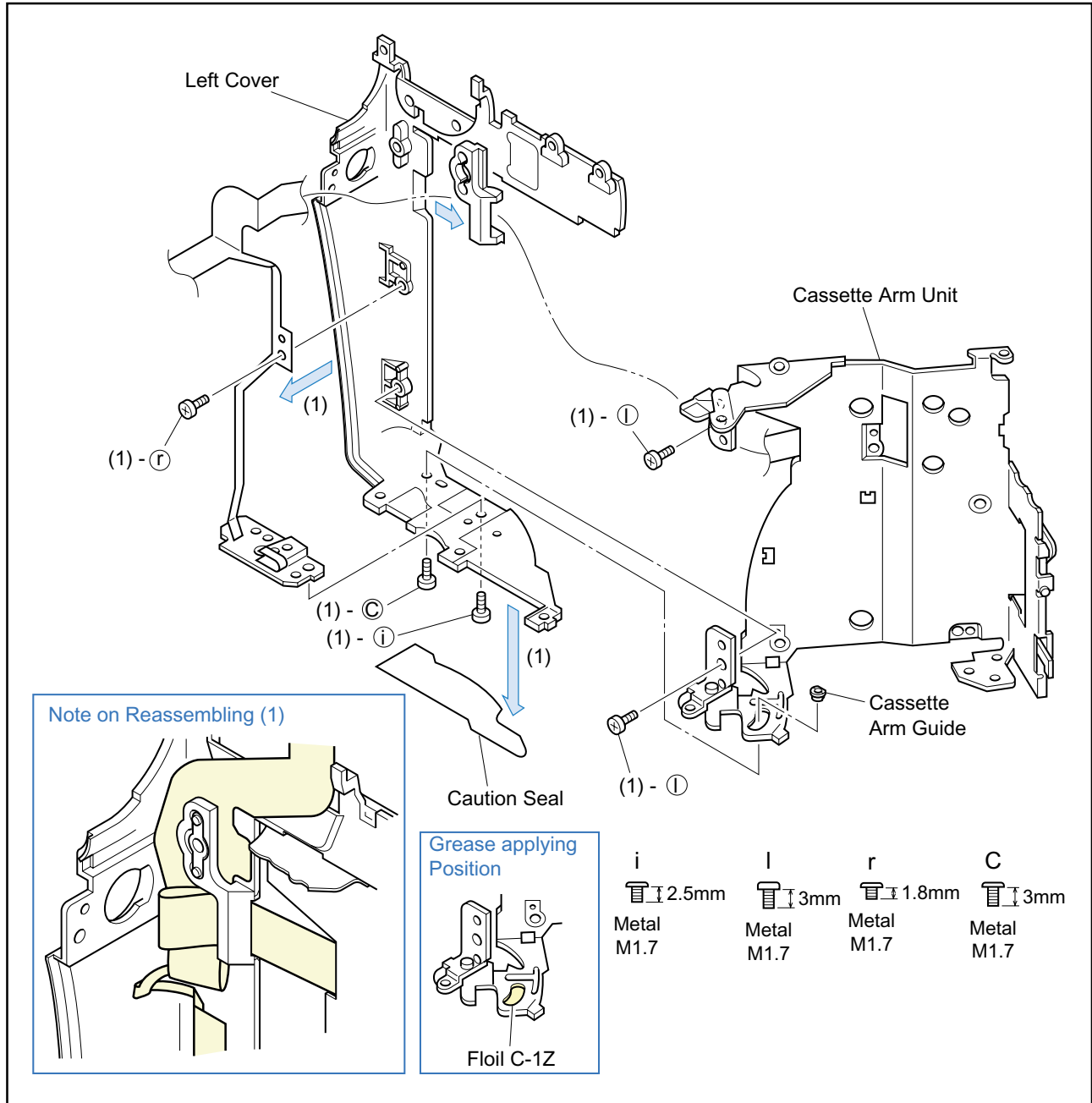


Fig. 4-12

## 1-14 Disassembly of Right Cover Unit 1

- (1) Remove two screws (x × 2) and detach the LCD Unit.
- (2) Remove two screws (l × 2) and detach the Battery Terminal Unit.
- (3) Remove one screw (y × 1) and detach the Tripod Plate.

### < Note on Reassembling >

- (1) Set the distance between the shadowed part of LCD-MAIN FPC and the step part of the Right Cover at 1mm as in the figure. Then secure them with the UL tape.

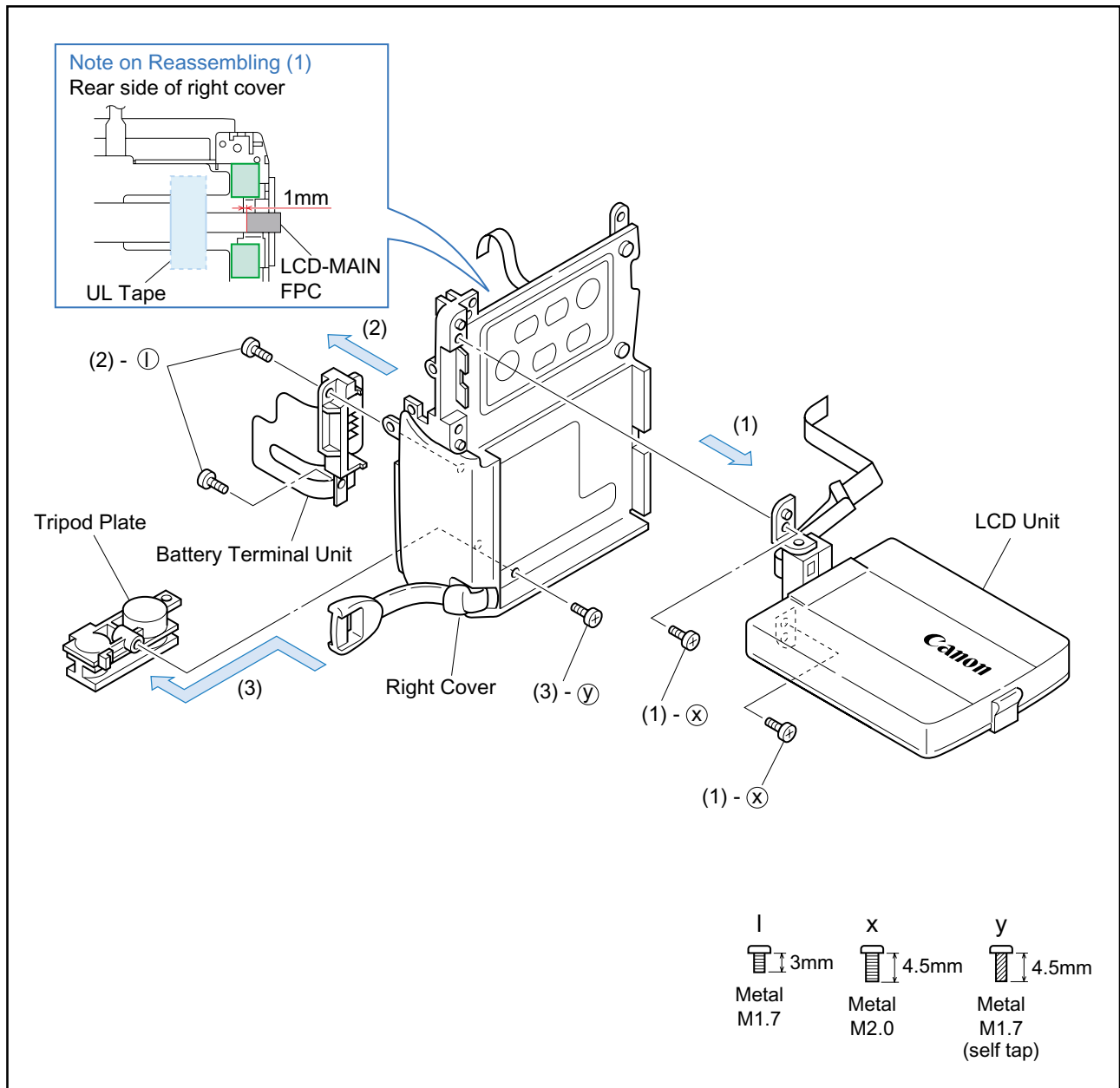


Fig. 4-13

## 1-15 Disassembly of Right Cover Unit 2

- (1) Separate the Recorder Key Unit from the Right Cover.

**Note :** The Recorder Unit is held in place by double-side adhesive tape. So, push it through the hole in the rear of Right Cover by a thin stick so it is raised, and then pulled slowly to separate it.  
Also, be careful not to damage the FPC when pulling it through the hole in Right Cover.

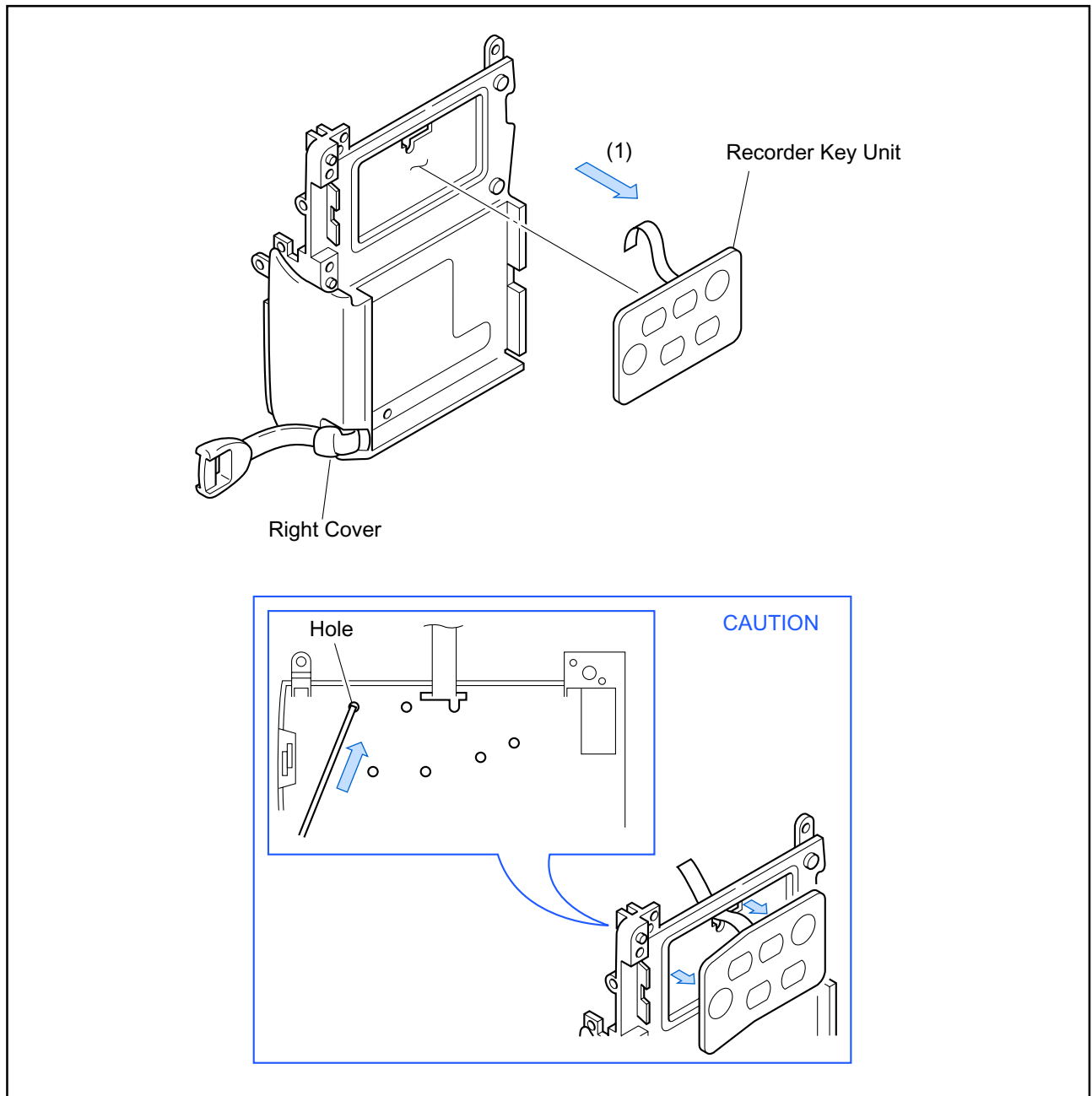


Fig. 4-14

## 1-16 Disassembly of LCD Unit 1

(1) Remove five screws (e × 5) then detach the LCD Top Cover while being careful with the Claw A.

### < Note on Reassembling >

(1) LCD Top Cover should be assembled after inserting the Claw A.

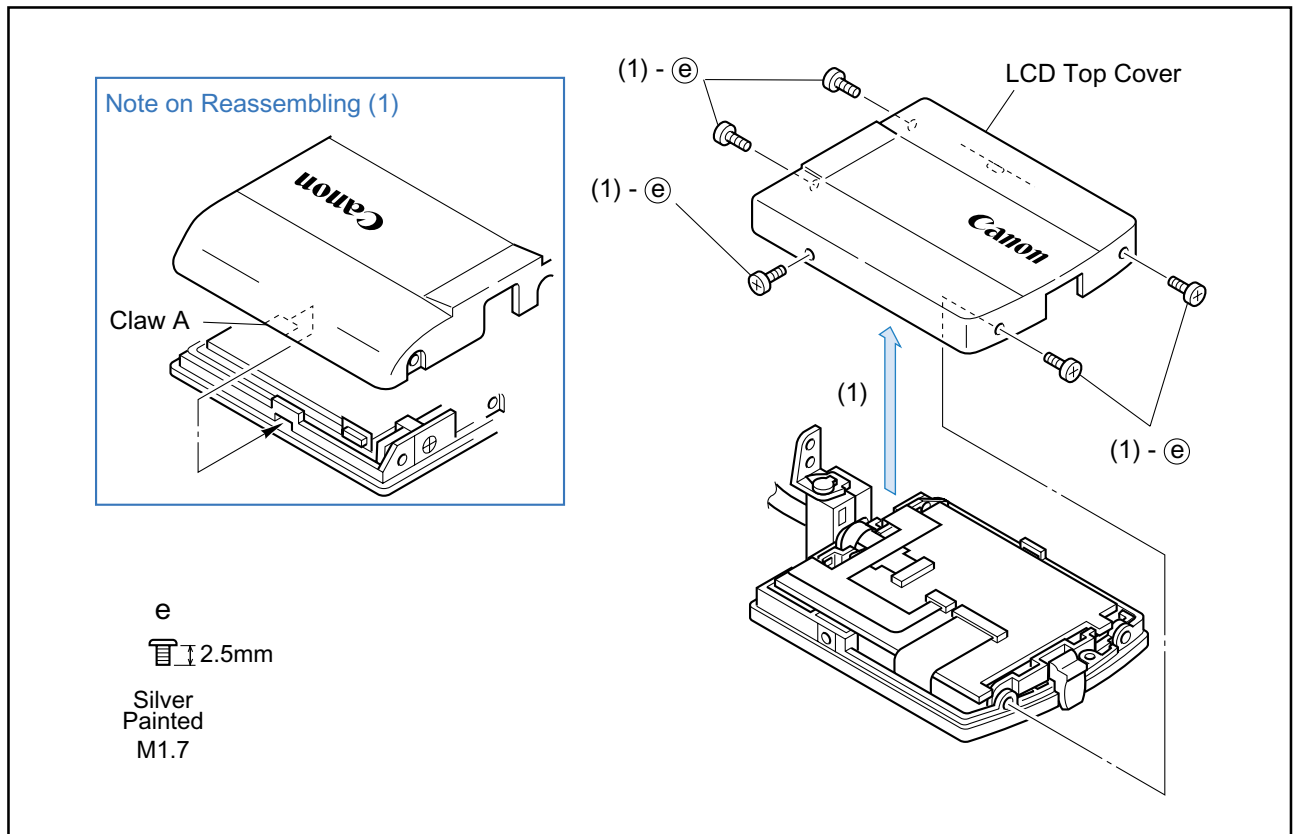


Fig. 4-15

## 1-17 Disassembly of LCD Unit 2

- (2) Remove CN901, CN902, CN903, unsolder at two places (B), and remove two screws ( $h \times 2$ ) to detach the LCD P.C.B., LCD Shield the Back Light Unit and LCD Panel.

### < Note on Reassembling >

- (1) Cover the element on the LCD P.C.B. with UL tape. Note, however, that UL tape should be attached so taht it will not protrube from the LCD P.C.B.
- (2) Mount the LCD P.C.B., LCD Shield and the Backlight Unit as in the Fig.4-16.

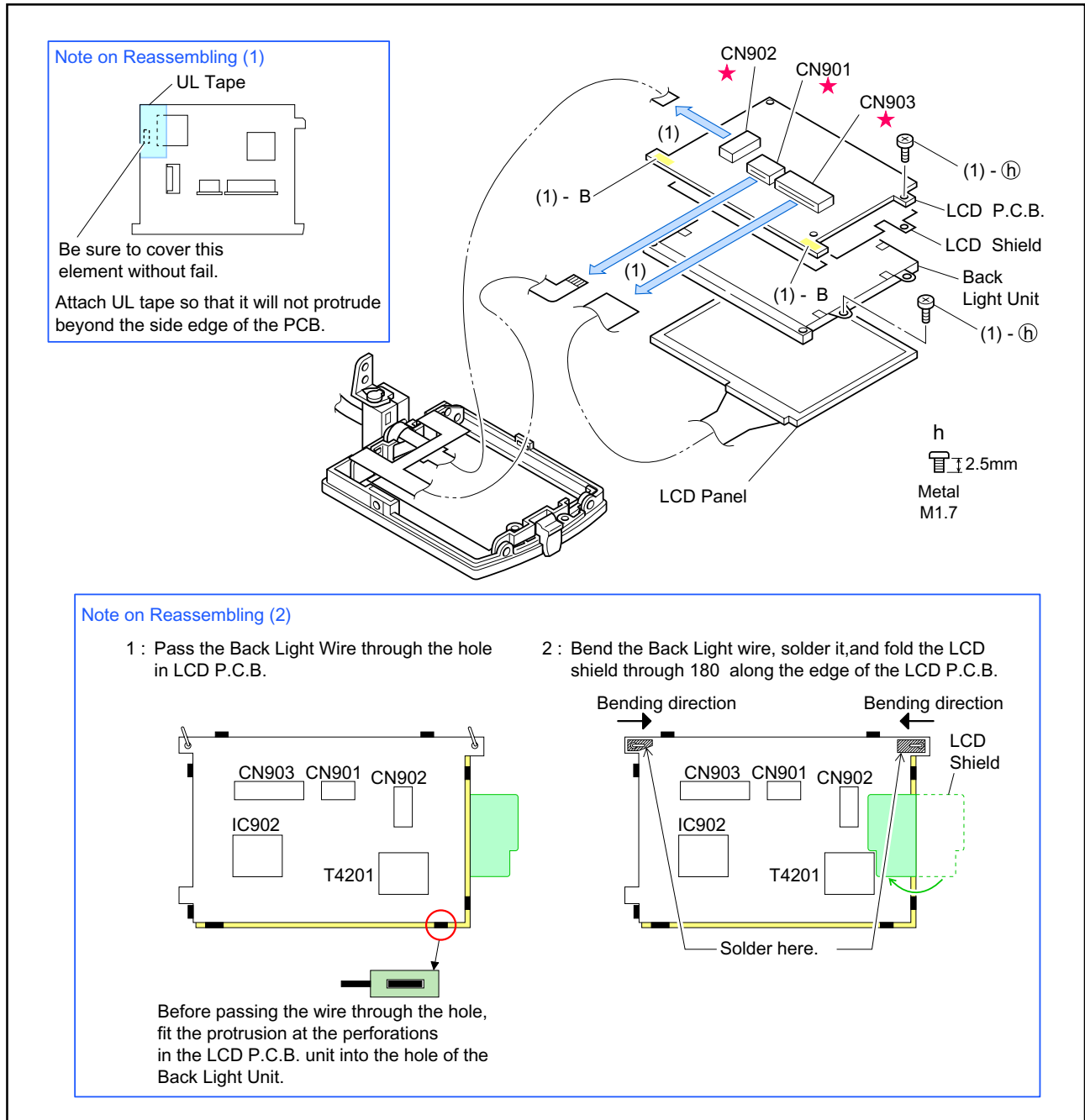


Fig. 4-16



## 1-18 Disassembly of LCD Unit 3

- (1) Remove one screw (j × 1) to detach the LCD Lock Switch.
- (2) Separate one screw (h × 1), LCD Hinge Unit and LCD SW FPC.
- (3) Remove two screws (D × 2), peel off the Magnet sheet and detach the Hinge Covers L,R.

### < Note on Reassembling >

- (1) The magnet has polarities.

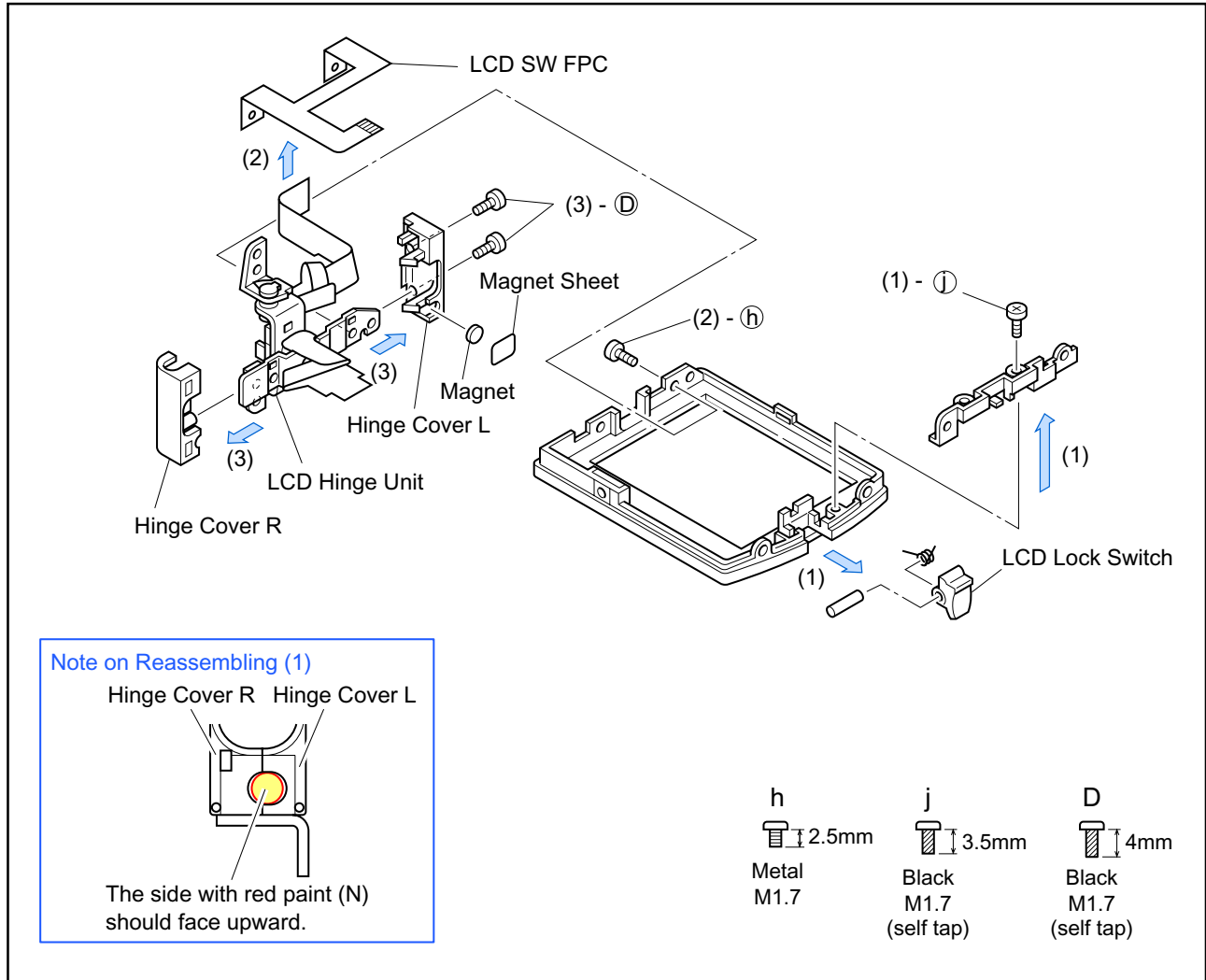


Fig. 4-17

## 1-19 Disassembly of LCD Unit 4

- (1) Remove the LCD FPC sheet and the LCD FPC from the Hinge unit.

### < Note on Reassembling >

- (1) Before using the LCD FPC of service part, cut the      part of it as indicated in the figure.  
Then, align the positions “1” with “2”, “3” with “4” respectively, and then fix them with the Kapton tape (DY9-3052-000) so that it covers the LCD FPC.
- (2) After wiring the LCD FPC around the Hinge Unit, be sure to wrap it with the LCD FPC Sheet before assembling.

### < Instruction for Supply >

LCD FPC, LCD FPC Sheet : Hanal FL778

Kapton Tape : Tape, Kapton DY9-3052-000

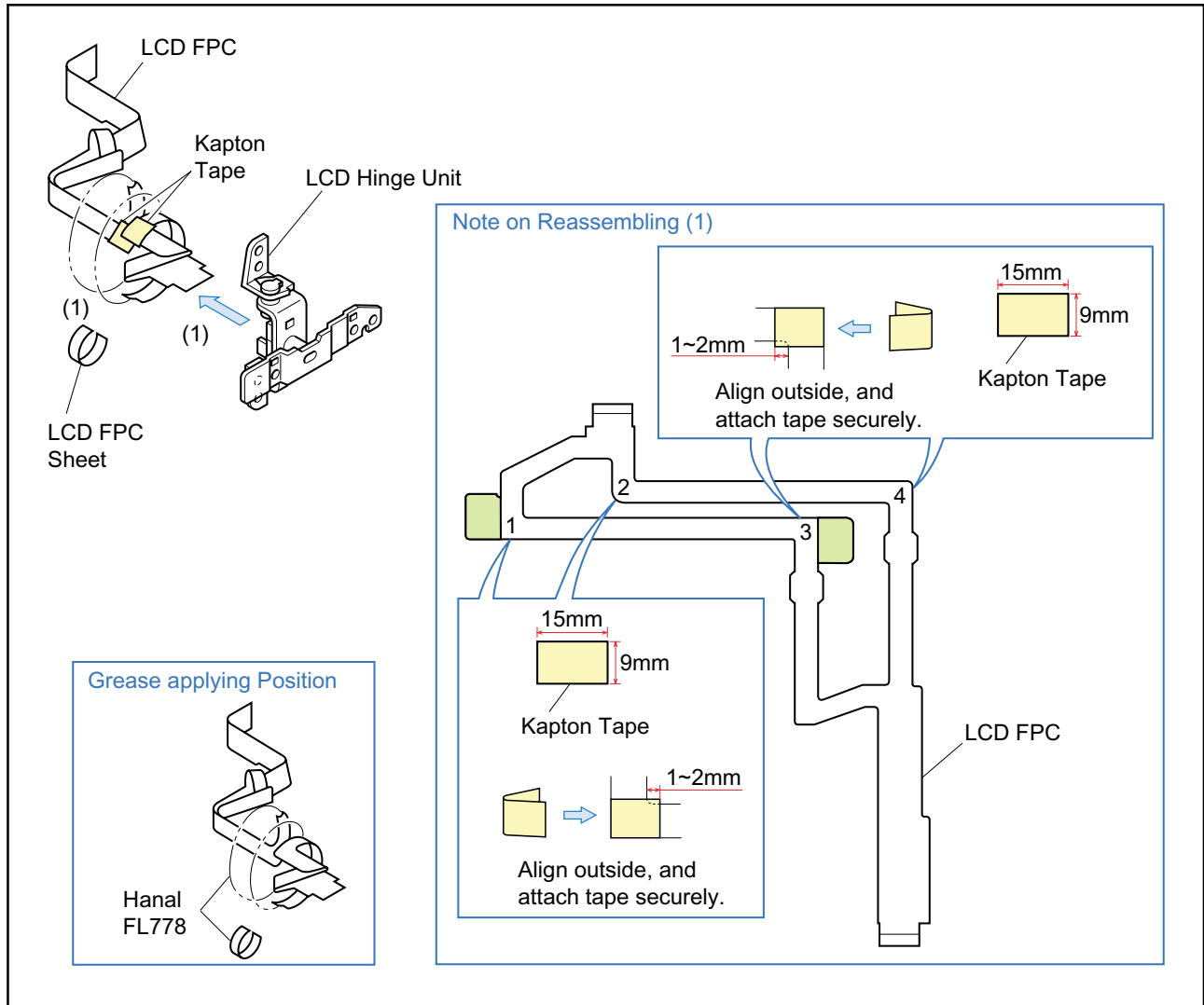


Fig. 4-18

## 1-20 Disassembly of CVF Unit

- (1) Detach two screws (z × 1, A × 1), CN4102 and the Rubber, then remove the CVF Plate, CVF P.C.B. and the Cushion.
  - (2) Unsolder part B and remove the Back Light Unit.
  - (3) Detach the LCD Stopper, CVF Panel and Mask.
- Note :** Detach the LCD Stopper while being careful about the four claws.
- (4) Remove the Clamp Washer, Finder Lever and Spring.

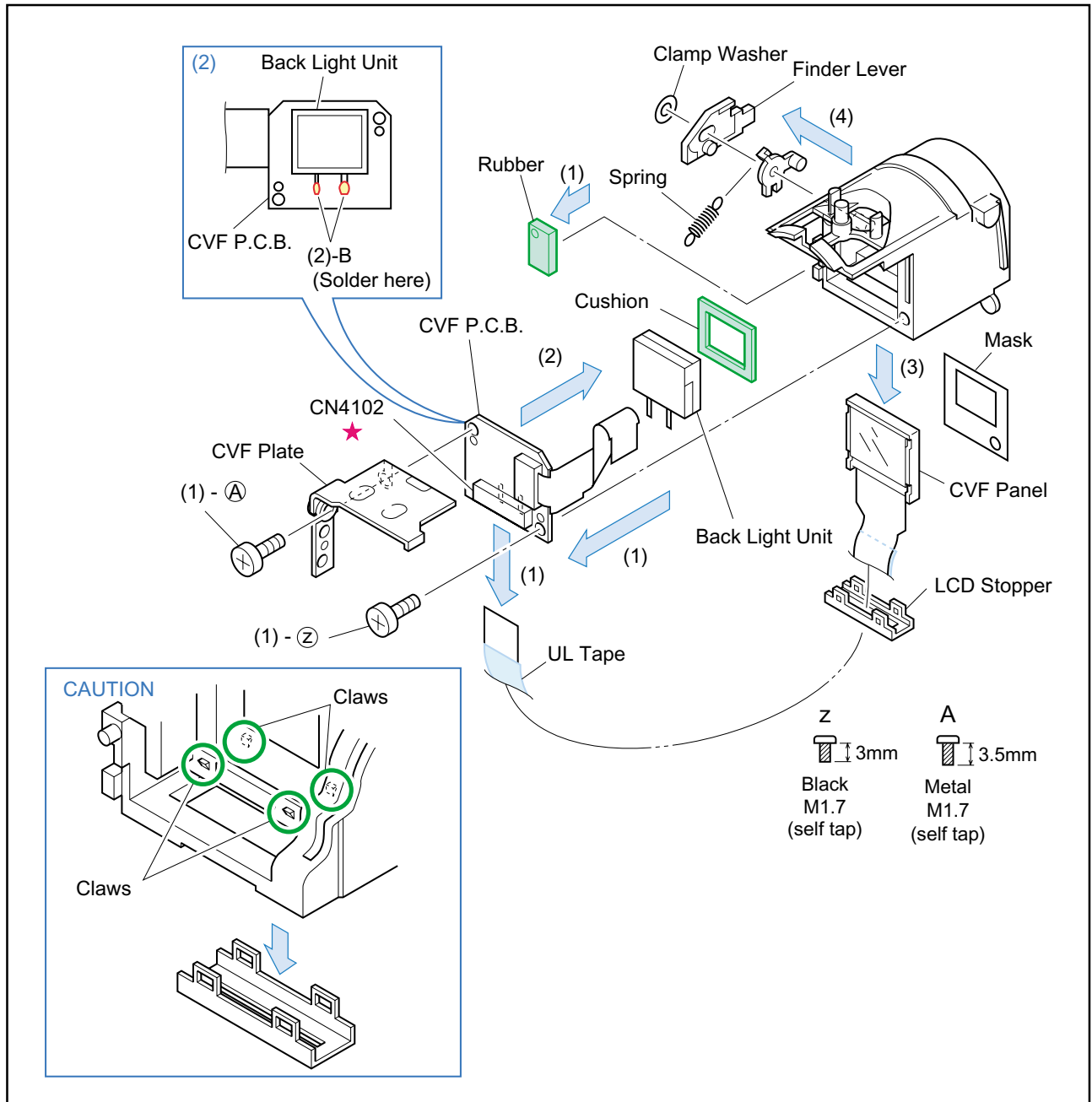


Fig. 4-19

## 1-21 Disassembly of Lens Unit 1

- (1) Detach the Lens Rubber Ring.
- (2) Remove two screws (o × 2), CCD Unit, CCD P.C.B., CCD Graphite, CCD Rubber and IR Filter.

### < Note on Reassembling >

- (1) Align the CCD Graphite with the edges of CCD P.C.B. and squeeze in so that it contacts the legs of CCD.
- (2) Be sure to attach the washer between the CCD P.C.B. and the CCD Unit.

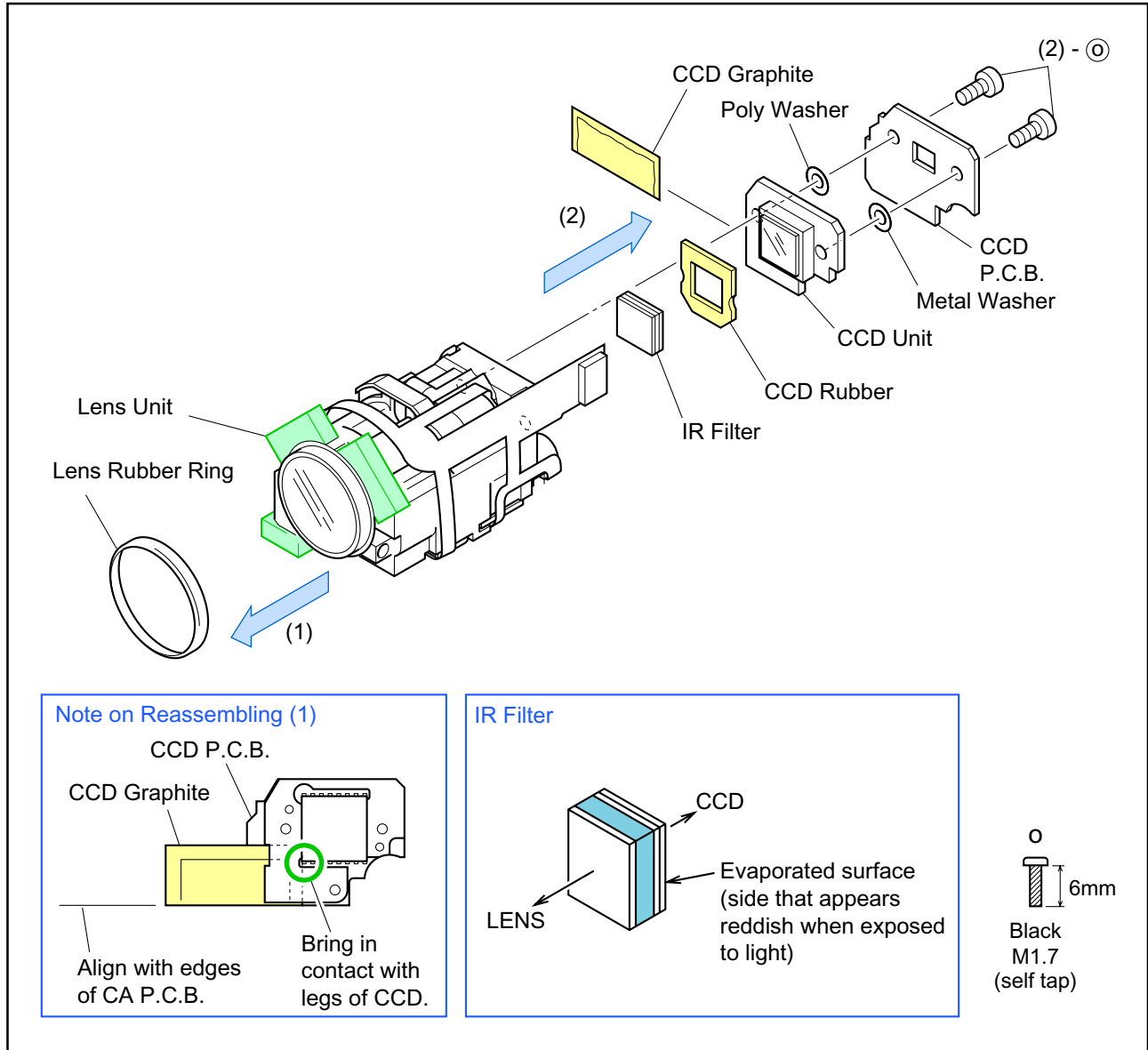


Fig. 4-20

## 1-22 Disassembly of Lens Unit 2

(3) Remove five screws (B  $\times$  5), IG meter, and AF/PZ Motor. (Unsolder parts to be replaced ( $\alpha$ ).)

### < Instruction for Supply >

AF/PZ motor shaft: LOGENEST LAMBDA A-74 (CY9-8102-000)

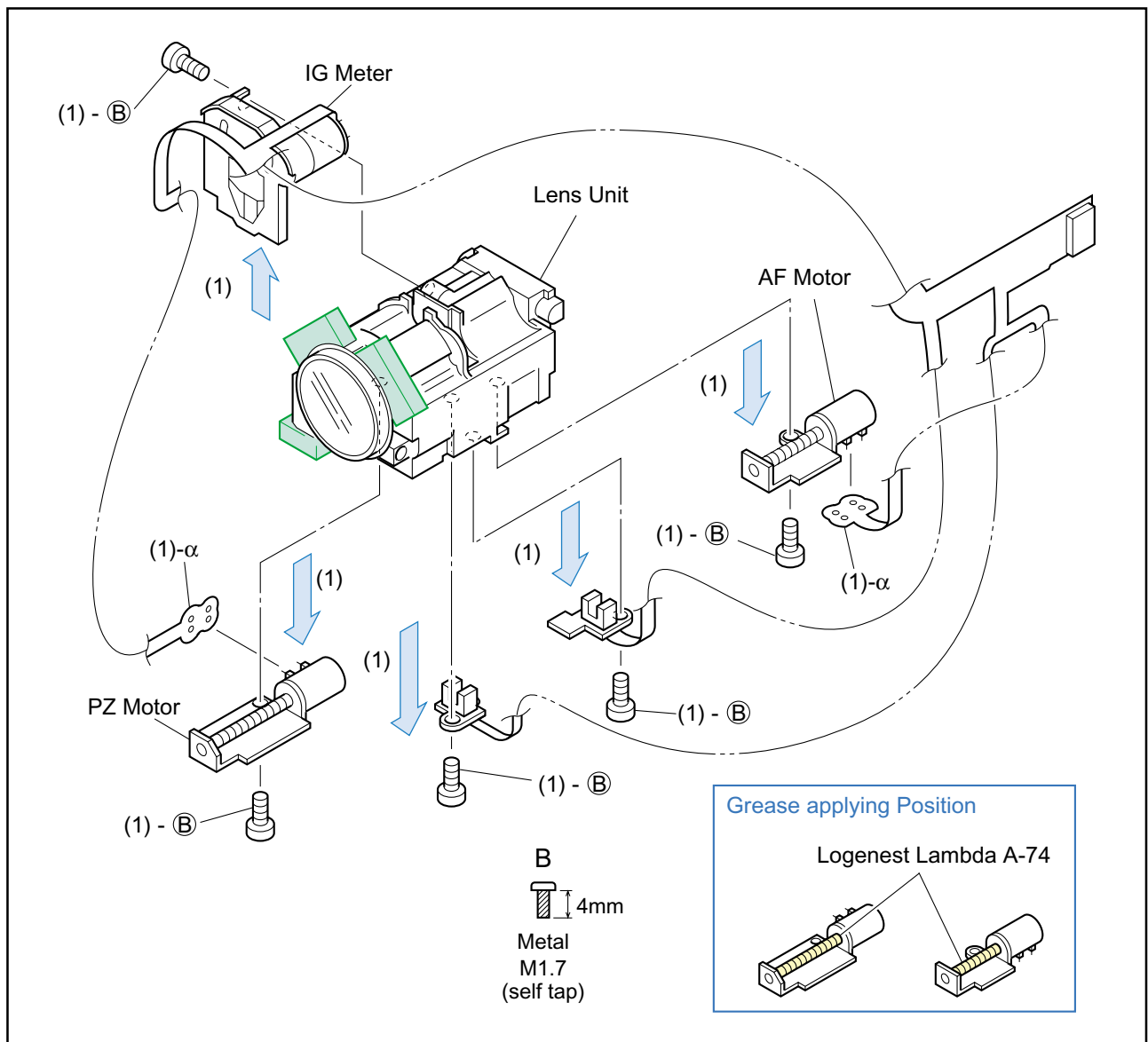
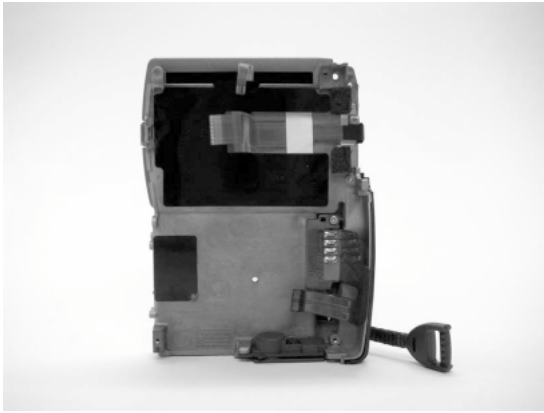


Fig. 4-21

## 1-23 List of Screws Used

SYMBOL	PARTS NO.	REMARKS	ILLUST	SYMBOL	REMARKS	REMARKS	ILLUST
a	DA2-1455-000	(Coated with XA1-7170-307) M1.7-3.0mm	 3mm	p	XA9-1167-000	Stepped Screw M1.4-3.5mm (METAL)	 3.5mm
b	DA2-1017-000	(Coated with XA9-1002-000) M1.7-3.0mm	 3mm	q	XA9-1260-000	Stepped Screw M1.4-3.0mm (METAL)	 3mm
c	DA2-1018-000	(Coated with XA4-5170-557) Self Tap M1.7-5.5mm	 5.5mm	r	XA9-1000-000	M1.7-1.8mm (thin head) (METAL)	 1.8mm
d	XA1-7170-357	M1.7-3.5mm (METAL)	 3.5mm	s	XA9-1002-000	M1.7-3.0mm (thin head) (METAL)	 3mm
e	DA2-1015-000	(Coated with XA9-1001-000) M1.7-2.5mm	 2.5mm	t	XA4-9140-287	Self Tap M1.4-2.8mm (METAL)	 2.8mm
f	XA1-7140-207	M1.4-2.0mm (METAL)	 2mm	u	XA1-7170-207	M1.7-2.0mm (METAL)	 2mm
g	DA2-1016-000	(Coated with XA4-9170-407) Self Tap M1.7-4.0mm	 4mm	v	XA1-7170-607	M1.7-6.0mm (METAL)	 6mm
h	XA1-7170-257	M1.7-2.5mm (METAL)	 2.5mm	w	XA9-1004-000	Self Tap M1.7-3.5mm (thin head) (METAL)	 3.5mm
i	XA9-1001-000	M1.7-2.5mm (thin head) (METAL)	 2.5mm	x	XA1-7200-457	M2.0-4.5mm (METAL)	 4.5mm
j	XA4-9170-359	Self Tap M1.7-3.5mm (BLACK)	 3.5mm	y	XA4-9170-457	Self Tap M1.7-4.5mm (METAL)	 4.5mm
k	XA1-7170-407	M1.7-4.0mm (METAL)	 4mm	z	XA4-9170-309	Self Tap M1.7-3.0mm (BLACK)	 3mm
l	XA1-7170-307	M1.7-3.0mm (METAL)	 3mm	A	XA4-9170-357	Self Tap M1.7-3.5mm (METAL)	 3.5mm
m	XA9-1244-000	Stepped Screw M1.4-4.5mm (BLACK)	 4.5mm	B	XA4-9170-407	Self Tap M1.7-4.0mm (METAL)	 4mm
n	CB1-8698-000	M1.4-1.3mm (BLACK)	 1.3mm	C	XA9-1274-000	M1.7-3.0mm (METAL)	 3mm
o	XA4-9170-609	Self Tap M1.7-6.0mm (BLACK)	 6mm	D	XA4-9170-409	Self Tap M1.7-4.0mm (BLACK)	 4mm

## 1-24 List of Disassembly Photos



**Right Cover Unit**



**Left Cover Unit**



**Left Cover FPC**



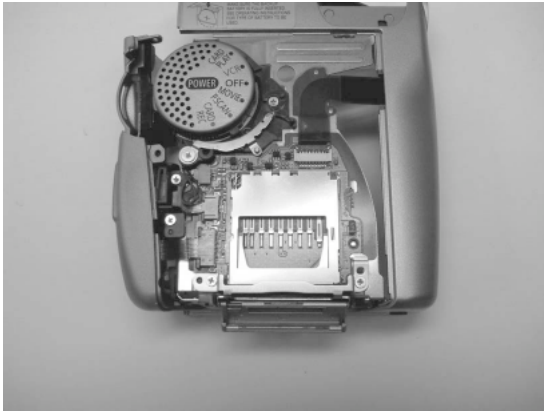
**Separation of Top Cover**



**Left Side**



**Camera Unit**



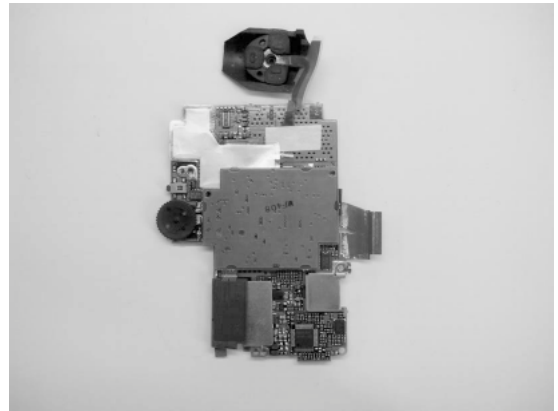
**MMC P.C.B.**



**Camera / Recorder Unit**



**Finder Unit**



**MAIN P.C.B. / AUDIO P.C.B.**



## 2. Adjustment Procedures

### 2-1 Adjustment Items in Part Replacement

After replacement of major parts, carry out adjustment referring to the table shown below. Note that the following table shows minimum required adjustments to be performed after replacing any major part. In case that two or more parts have been replaced or any faulty condition has occurred, take a proper adjustment procedure accordingly.

: Adjustment required

Camera system						
No.	Adjustment item	Part name				Adjustment setting
		Lens	SUB PCB	CCD	MAIN PCB	
2-2 AF section						
2-2-1	CZ Adjustment					Product condition
2-2-2	Zoom Performance Check					Product condition
2-3 IS section						
2-3-1	Gyro Offset Auto Adjustment					Product condition
2-3-2	Gyro Gain Adjustment					Product condition
2-3-3	EEPROM Writing					Product condition
2-4 Camera section						
2-4-1	Iris Encoder Adjustment					Product condition
2-4-2	WB Adjustment (1)					Product condition
2-4-3	Color Balance Adjustment					Product condition
2-4-4	WB Adjustment (2)					Product condition
2-4-5	WB Adjustment (3)					Product condition
2-4-6	EEPROM Writing					Product condition
2-5	CCD Pixel Missing Compensation					Product condition

Recorder system						
No.	Adjustment item	Part name				Adjustment setting
		MAIN PCB	DMC II			
2-6 Recorder section						
2-6-1	Recorder Setting for Destination					Product condition
2-6-2, 2-6-3	Y LEVEL / C LEVEL Adjustment					Product condition
2-6-4	AGC Initial Value Adjustment					Product condition
2-6-5	SWP Adjustment					Product condition
2-6-6	C. FG Adjustment					Product condition
2-6-7	EQ Adjustment					Product condition
2-6-8	Battery Voltage Drop Adjustment					Product condition
DMC II						
2-7	Tape Path Adjustment					Tape path adjustment setting

## 2-2 AF Section Adjustment

### Preparation)

- 1) For CZ adjustment/zoom performance check, set the product condition.
- 2) Adjustment condition (initial condition)
 

Program AE	: Auto Mode
ZOOM	: Telephoto-end
CZ adjustment chart	: 2.4 ± 0.02 m from lens front
Chart luminance	: 500 lux or more (High illuminance should be avoided at the wide-angle end.)

### 2-2-1 CZ Adjustment

CHART CZ adjustment chart

SPEC. Automatic adjustment : At STEP 3, DT : AA should be attained and the specified zoom performance shall be satisfied.

### Procedure)

- (1) In the telephoto-end setting, bring the center of chart image to the center of monitor TV.
- (2) Referring to the table shown below, carry out CZ adjustment in the service mode.
- (3) Turn power OFF and then ON, and check the zoom performance.

STEP	PROCEDURE CZ	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	1 ↑	WR RD	**00 ↑	31 ↑	WAIT OK	High address "31" is set up.
2	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	0 ↑	WR RD	313A ↑	90 ↑	WAIT OK	Date setting for adjustment is completed.
3	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	3 ↑	WR RD	**00 ↑	31 ↑	WAIT OK	High address "31" is set up.
4	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR ↑	3100 ↑	00 01~08	WAIT BUSY	Automatic adjustment is started. Then, it is completed in 30 seconds approximately. If any NG condition is encountered in automatic adjustment, check the parts inside the lens
5	Judgment on result of adjustment	5 ↑	2 ↑	RD RD	3100 ↑	AA FF	OK NG	Adjustment is completed (result is OK). Carry out the zoom performance check. Adjustment is completed (result is NG). Take the procedure again from the beginning.

### 2-2-2 Zoom Performance Check

CHART CZ adjustment chart

SPEC. "DT at address 30D2="01" in steps (3),(4) below

Difference between "DTs at address 30D3" in steps (3),(4) below is within "±4 Hex".

### Procedure)

- (1) In the telephoto-end setting, bring the center of chart image to the center of monitor TV, and set AF OFF.
- (2) Perform slow-speed zooming from the telephoto position to the wide-angle position. Make sure that defocusing does not occur.
- (3) At the wide-angle setting, read out data at the focus position according to the table below.
- (4) Turn AF ON, and read out data at the focus position as in (3) above.
- (5) Check whether or not the data read out in (3) and (4) satisfies the specification.
- (6) Turn power OFF and then ON. Carry out zooming several times reciprocally for a distant object and check that defocusing does not occur. (AF ON)
- (7) If the results of check at steps (2), (5) and (6) are OK, the adjustment is completed. If the results are NG, carry out CZ adjustment again.

STEP	PROCEDURE ZOOM CHECK	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	1 ↑	WR RD	**00 ↑	30 ↑	WAIT OK	High address "30" is set up.
2	1) Read out data in the setting shown at right.	5 ↑	0 ↑	RD ↑	30D2 30D3	"--" "--"	WAIT ↑	Data at address 30D2 is indicated. Data at address 30D3 is indicated.

## 2-3 IS Section Adjustment

### Note)

- 1) Carry out the adjustment on a tripod or a vibration-free bench.

### Preparation)

- 1) Carry out IS adjustment in a product status.

### <Preparation for IS adjustment>

STEP	PROCEDURE IS ADJ MODE	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	3 ↑	WR RD	**00 **00	32 ↑	WAIT OK	High address "32" is set up.

## 2-3-1 GYRO OFFSET Adjustment

SPEC. Automatic adjusutment

### Procedure)

- (1) Wait at least 10 seconds while being careful not to apply vibration to the camera.
- (2) Referring to the table shown below, perform the automatic adjustment.

STEP	PROCEDURE GYRO OFFSET	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3206 ↑	00 ↑	WAIT OK	Adjustment is completed.

## 2-3-2 GYRO GAIN Adjustment

SPEC. Date Writing

### Procedure)

- (1) Reset the data to be the original, referring to the table shown below.

STEP	PROCEDURE GYRO GAIN	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	Gyro YAW gain adjustment							
1-1	1) Make the setting shown at right. 2) Press the STORE key	5 ↑	2 ↑	WR RD	3200 ↑	66 ↑	WAIT OK	Adjustment is completed.
2	Gyro PITCH gain adjustment							
2-1	1) Make the setting shown at right. 2) Press the STORE key	5 ↑	2 ↑	WR RD	3201 ↑	6F ↑	WAIT OK	Adjustment is completed.

## 2-3-3 EEPROM Writing

SPEC. Automatic writing

### Procedure)

- (1) Referring to the table shown below, write the adjustment data (from 2-3-1 through 2) into EEPROM.

STEP	PROCEDURE EEPROM WRITING	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	3208 ↑	00 ↑	WAIT OK	Writing is completed.

## 2-4 Camera Section Adjustment

### Notes)

- Each adjustment data (2-4-1 to 2-4-5) becomes effective after it is written into the EEPROM as mentioned in 2-4-6. If power must be turned OFF/ON during each adjustment, be sure to perform the EEPROM write procedure as mentioned in 2-4-6.
- The adjustments from 2-4-2 through 2-4-5 must be carried out in series.

### Preparation)

- For camera section adjustment, take the product condition.
- Adjustment condition (initial condition)
  - Program AE : Auto Mode
  - AF : OFF
  - Image stabilizer : OFF
  - Chart : Standard angle of view

### <Preparation for camera adjustment>

- Referring to the table shown below, set the high address for camera adjustment mode.

STEP	PROCEDURE	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right.	5	3	WR	**00	30	WAIT	High address "30" is set up.
	2) Press the STORE key.	↑	↑	RD	↑	↑	OK	

### 2-4-1 Iris Encoder Adjustment

CHART Light box (5600°K)

SPEC. Automatic adjustment.

### Procedure)

- Referring to the table shown below, adjust the Iris Encoder.

STEP	PROCEDURE	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right.	5	2	WR	3000	00	WAIT	Adjustment is in progress. Adjustment is completed.
	2) Press the STORE key.	↑	↑	WR	↑	↑	BUSY	
		↑	↑	RD	↑	↑	OK	

### 2-4-2 WB Adjustment (1)

CHART Light box (5600°K)

SPEC. Automatic adjustment

### Procedure)

- Referring to the table shown below, carry out WB adjustment (1).

STEP	PROCEDURE	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right.	5	2	WR	3002	00	WAIT	Adjustment is in progress. Adjustment is completed.
	2) Press the STORE key.	↑	↑	WR	↑	↑	BUSY	
		↑	↑	RD	↑	↑	OK	

### 2-4-3 Color Balance Adjustment

CHART	Lightbox (5600°K), and color bar chart (white area at the left side)
M.EQ.	Vectorscope
TP/TRIG.	VIDEO OUT
SPEC.	R : × 2.0(ratio to burst)104°, Ye : × 1.4 (ratio to burst) 168°

#### Procedure)

(1) For manual adjustment of color balance, change data at the following four addresses while observing a vectorscope.

STEP	PROCEDURE CB	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
R-Y GAIN	1) In the setting shown at right, adjust relevant data.	5	2	WR	3007	"ADJ"	WAIT	Adjustment is in progress.
	2) Press the STORE key.	↑	↑	RD	↑	ADJ	OK	Adjustment is completed.
B-Y GAIN	1) In the setting shown at right, adjust relevant data.	5	2	WR	3008	"ADJ"	WAIT	Adjustment is in progress.
	2) Press the STORE key.	↑	↑	RD	↑	ADJ	OK	Adjustment is completed.
R-Y MAT	1) In the setting shown at right, adjust relevant data.	5	2	WR	3009	"ADJ"	WAIT	Adjustment is in progress.
	2) Press the STORE key.	↑	↑	RD	↑	ADJ	OK	Adjustment is completed.
B-Y MAT	1) In the setting shown at right, adjust relevant data.	5	2	WR	300A	"ADJ"	WAIT	Adjustment is in progress.
	2) Press the STORE key.	↑	↑	RD	↑	ADJ	OK	Adjustment is completed.

### 2-4-4 WB Adjustment (2)

CHART	Light box (5600°K), and CCA12 filter
SPEC.	Automatic adjustment

#### Procedure)

(1) Referring to the table shown below, carry out WB adjustment (2).

STEP	PROCEDURE WB (2)	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	5	2	WR	3004	00	WAIT	Adjustment is in progress. Adjustment is completed.
		↑	↑	WR	↑	↑	BUSY	
		↑	↑	RD	↑	↑	OK	

### 2-4-5 WB Adjustment (3)

CHART	Light box (5600°K)
SPEC.	Automatic adjustment

#### Procedure)

(1) Referring to the table shown below, carry out WB adjustment (3).

STEP	PROCEDURE WB (3)	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	5	2	WR	3005	00	WAIT	Adjustment is in progress. Adjustment is completed.
		↑	↑	WR	↑	↑	BUSY	
		↑	↑	RD	↑	↑	OK	

### 2-4-6 EEPROM Writing

SPEC.	Automatic writing
-------	-------------------

#### Procedure)

(1) Referring to the table shown below, write adjustment data (from 2-4-1 to 2-4-5) into the EEPROM.

STEP	PROCEDURE EEPROM WRITING	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right.	5	2	WR	3006	00	WAIT	Writing is completed.
	2) Press the STORE key.	↑	↑	RD	↑	↑	OK	

## 2-5 CCD Pixel Missing Compensation

### Notes)

- 1) Perform this adjustment only if a void pixel is found on the CCD.
- 2) Before starting this adjustment, turn power on for more than 15 minutes.
- 3) The automatic mode (2-5-1) and the manual mode (2-5-2) are available for this adjustment.  
In the automatic adjustment mode, “NG” is recognized if there are more than two void pixels on the center area of the screen or more than eight void pixels on the entire screen. (If NG is recognized, the automatic adjustment is not performed.)  
In the manual adjustment mode, it is allowed to correct up to eight void pixels on the entire screen.  
In this mode, an arbitrary point may be selected for correction.

### 2-5-1 CCD Void Pixel Correction (Automatic)

#### Preparation)

- 1) Carry out this correction in the product state.
- 2) Adjustment Conditions  
Program AE : AUTO  
AF : OFF  
Image stabilizer : OFF  
Demo mode : OFF

#### Procedure)

- (1) Perform the CCD void pixel correction (automatic mode) according to the table shown below.

STEP	PROCEDURE CCD PIXEL MISSING COMP.	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	High address setting							
1-1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	3 ↑	WR RD	**00 ↑	30 ↑	WAIT OK	High address "30" is set up.
2	CCD void pixel correction							
2-1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑ ↑	2 ↑ ↑	WR ↑ RD	300E ↑ ↑	00 ↑ —	WAIT BUSY OK	Adjustment is in progress. Adjustment is completed. *
3	EEPROM writing							
3-1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	2 ↑	WR RD	300F ↑	00 ↑	WAIT OK	Writing is completed.

\* If the DT is “FF” , it is “NG” even through the ST is “OK”.

## 2-5-2 CCD Void Pixel Correction (Manual)

### Note)

- 1) Use the full scan monitor for this adjustment.

### Preparation)

- 1) Take the product condition for this adjustment.
- 2) Adjustment conditions
 

Program AE	: LOW LIGHT
AF	: OFF
Image stabilizer	: OFF
Electronic zoom	: OFF

M.EQ.      Monitor TV

### Procedure)

- (1) Before switching to the service mode, press the data screen key on the LANC remote controller to turn OFF the data screen.
- (2) Select the service mode, and then set up the CCD void pixel correction adjustment mode (manual) following the table given below.

STEP	PROCEDURE CCD PIXEL MISSING COMP.	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	3 ↑	WR RD	**00 ↑	FF ↑	WAIT OK	High address "FF" is set up.
2	1) Make the setting shown at right.	5	2	RD	FF00	00	WAIT	Entering the CCD pixel missing compensation mode is complete. (AGC MAX., Iris close)
3	1) Make the setting shown at right. 2) Press the STORE key.	5 ↑	3 ↑	WR RD	FFFF ↑	06 ↑	WAIT OK	See table below for angle of CCD. for selection. (Unused marker is appeared at view angle of "Area"G.)

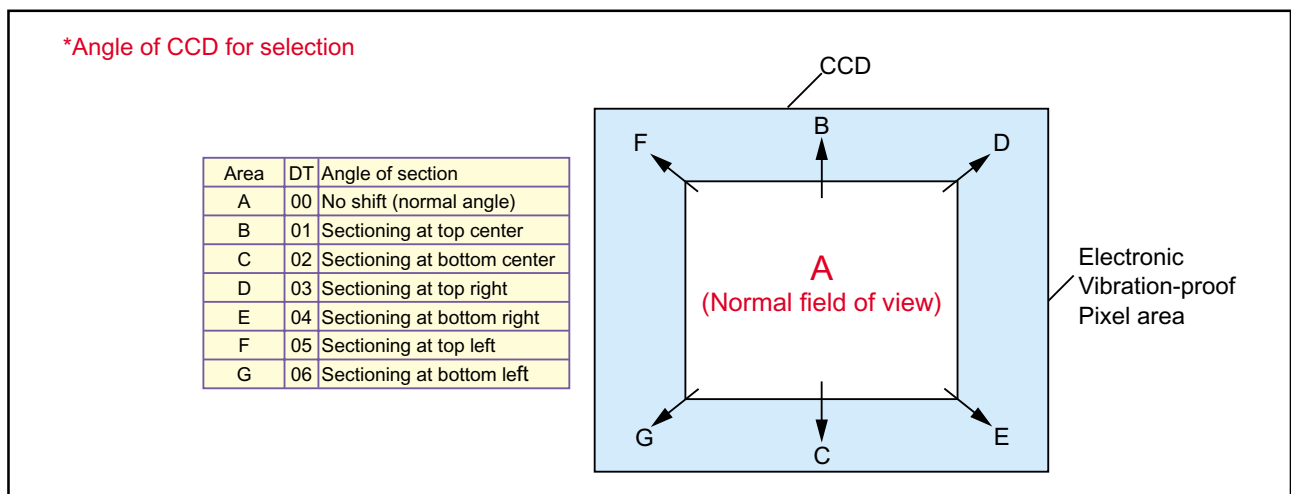


Fig. 4-22

- (3) Press the data screen key on the LANC remote controller to turn OFF the data screen.
- (4) Move an unused marker (arranged at left of screen) to the position where a pixel is missing. The movement is done by changing the data at the address corresponding to each marker.  
The addresses corresponding to the markers are shown in Fig.4-23

### Notes)

- 1) The odd-numbered marker is for odd-numbered lines (ODD) and the even-numbered marker is for even-numbered lines (EVEN).  
If the marker cannot be aligned with a pixel void position, use the marker for a different line.

- 2) As shown in the Fig.4-22, the pixel missing compensation over entire CCD area cannot be performed on a single screen due to the electronic vibration- proof area. Therefore, before the adjustment, change the data of the STEP 3 to select the area for compensation.

If the marker is not appeared at this time, choose the area where the marker appears, move the marker toward the area for compensation until it appears on the desired area, and write the data temporarily. Then, select the compensation area again, and move the marker to the pixel void position.

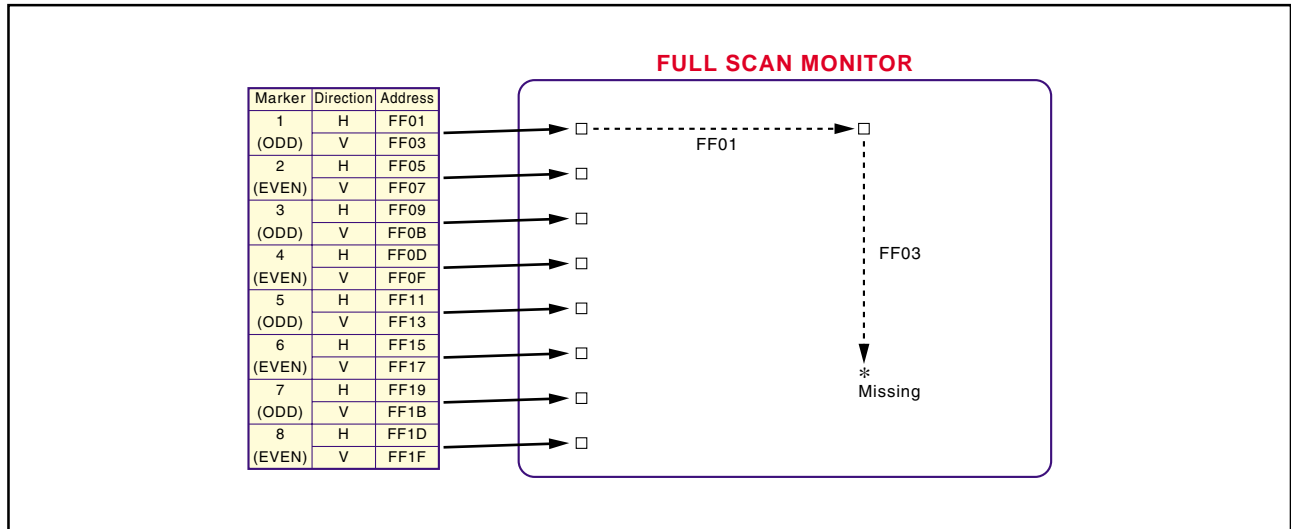


Fig. 4-23

\* The following table shows the procedure for moving marker 1.

STEP	PROCEDURE CCD PIXEL MISSING COMP.	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Specify address in H direction and set WR mode.	5	2	WR	FF01	D4	WAIT	
	2) Change the data and then move the marker (H direction).	↑	↑	↑	↑	ADJ	↑	
	3) Press the STORE key.	↑	↑	↑	↑	↑	OK	
2	1) Specify address in V direction and set WR mode.	5	2	WR	FF03	A0	WAIT	
	2) Change the data and then move the marker (H direction).	↑	↑	↑	↑	ADJ	↑	
	3) Press the STORE key.	↑	↑	↑	↑	↑	OK	
3	Repeat steps 1 and 2 above, and register the marker at the position where pixel is missing.							

(5) Carry out write-in to EEPROM according to the table below.

STEP	PROCEDURE CCD PIXEL MISSING COMP.	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	In case of markers 1 to 4							Writing is completed.
	1) Make the setting shown at right.	5	2	WR	FF20	00	WAIT	
	2) Press the STORE key.	↑	↑	RD	↑	↑	OK	
	In case of markers 5 to 8							
	1) Make the setting shown at right.	5	2	WR	FF21	00	WAIT	Writing is completed.
	2) Press the STORE key.	↑	↑	RD	↑	↑	OK	

(6) Reset the service mode, and close the lens.

After ten seconds, check that missing pixels have been compensated for.

### Notes)

- Since the marker is larger than a pixel, although they may seem to be superposed on one another at adjustment, there may actually be some deviation.
- In marker overlap condition or when there are adjacent missing pixels within  $\pm 2$  Hex in the V and H directions, writing is impossible.



## 2-6 Recorder Section Adjustment

### Preparation)

- Except for the tape-path adjustment, carry out adjustment in the product state.

### 2-6-1 Recorder Setting for Destination

SPEC. Data writing

### Procedure)

- Referring to the table shown below, carry out the recorder setting for destination market place.

STEP	PROCEDURE RECORDER DESTINATION	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 3) Press the STORE key.	6 ↑	5 ↑	WR RD	**00 ↑	01 ↑	*	High address "01" is set up.
2	1) Make the setting shown at right. (For USA model)	6	4	WR	0112	F0		Function Select bit for USA
	2) Make the setting shown at right (For Japan model)	6	4	WR	0112	F1		Function Select bit for JPN
	3) Press the STORE key.	↑	↑	RD	↑	F0orF1	*	The recorder setting for destination market place is completed.

### 2-6-2 Y LEVEL Adjustment

TP/TRIG. VIDEO OUT

M. EQ. Oscilloscope

SPEC.  $Y=980 \pm 20$  [mV]

### Procedure)

- Referring to the table shown below, carry out Y level adjustment.

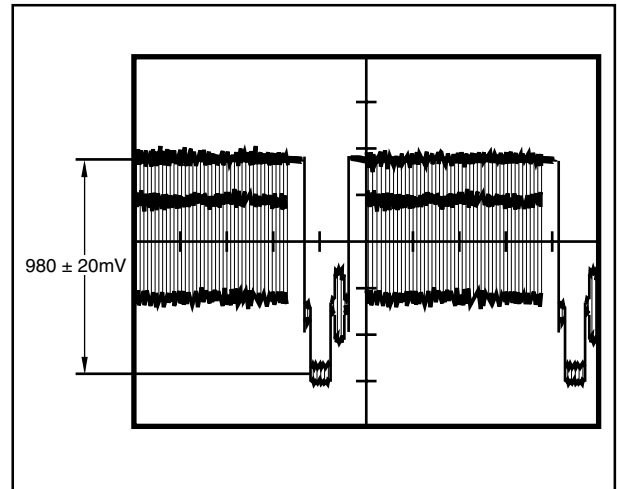


Fig.4-24

STEP	PROCEDURE Y LEVEL	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) For adjustment, change data properly. 3) Press the STORE key.	6 ↑ ↑	4 ↑ ↑	WR ↑ RD	001E ↑ ↑	ADJ "ADJ" ↑	  *	White raster is output. Adjustment is in progress. Adjustment is completed.

### 2-6-3 C LEVEL Adjustment

TP/TRIG.	VIDEO OUT
M. EQ.	Oscilloscope
SPEC.	C=710 ± 20 [mV]

#### Procedure)

- Referring to the table shown below, carry out C level adjustment.

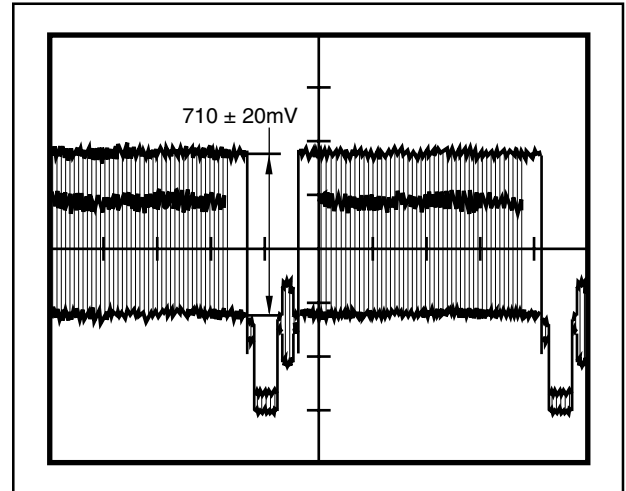


Fig.4-25

STEP	PROCEDURE C LEVEL	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right.	6	4	WR	001F	ADJ		Green raster is output.
	2) For adjustment, change data properly.	↑	↑	↑	↑	↑		Adjustment is in progress.
	3) Press the STORE key.	↑	↑	RD	↑	↑	*	Adjustment is completed.

### 2-6-4 AGC Initial Value Adjustment

SIGNAL	COLOR BAR
MODE	E-E (ANALOG LINE IN)
SPEC.	Automatic adjustment

#### Procedure)

- Input a color bar signal to the analog line circuit from the pattern generator.
- Carry out AGC initial value adjustment according to the table shown below.

STEP	PROCEDURE AGC INITIAL	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right.	7	0	WR	**04	--		
	2) Press the STORE key.	↑	↑	↑	↑	↑	+	Automatic adjustment is in progress.
		↑	↑	RD	↑	↑	*	Automatic adjustment is completed.

### 2-6-5 SWP Adjustment

MODE	Playback of color bar master (DY9-1321-000)
SPEC.	Automatic adjustment

#### Note)

- 1) Press the STORE key after the error rate is stabilized.

#### Procedure)

- (1) While playing back the color bar master, carry out SWP adjustment referring to the table shown below.

STEP	PROCEDURE SWP	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	7	0	WR	**01	--		
		↑	↑	↑	↑	↑	+	Automatic adjustment is in progress.
		↑	↑	RD	↑	↑	*	Automatic adjustment is completed.

### 2-6-6 C. FG Adjustment

MODE	Playback of color bar master (DY9-1321-000)
SPEC.	Automatic adjustment

#### Procedure)

- (1) While playing back the color bar master, carry out C.FG adjustment referring to the table shown below.

STEP	PROCEDURE C.FG	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	7	0	WR	**03	--		
		↑	↑	↑	↑	↑	+	Automatic adjustment is in progress.
		↑	↑	RD	↑	↑	*	Automatic adjustment is completed.

### 2-6-7 EQ Adjustment

MODE	Playback of self-recording LP tape (conforming to the format of LP tape manufactured by Panasonic)
SPEC.	After adjustment, an error rate should be $2 \times 10^{-5}$ or less.

#### Notes)

- 1) For error rate measurement, use a tape conforming to the format of LP tape manufactured by Panasonic.
- 2) For SP/LP selection in recording, use the Recorder menu.

#### Procedure)

- (1) Referring to the table shown below, carry out EQ adjustment.
- (2) After adjustment, play the self-recorded LP part again and check that the error rate is within the allowable specified range.
- (3) If the result of check is NG, perform EQ adjustment using the self-recording SP tape. Then, with this LP tape, perform EQ adjustment again.

STEP	PROCEDURE EQ	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Start LP recording.							
2	1) Rewind the recorded part, and then start LP playing back.							
3	1) During LP playback, make the setting shown at right 2) Press the STORE key.	7	0	WR	**02	--		
		↑	↑	↑	↑	↑	+	Automatic adjustment is in progress. (For approx. ten seconds)
		↑	↑	RD	↑	↑	*	Adjustment is completed.

## 2-6-8 Battery Voltage Drop Adjustment

MODE	During camera recording in product condition (AF : OFF, LCD PANEL : ON)
SPEC.	Power supply voltage: $5.83 \pm 0.02$ [V]

### Note)

- 1) Perform the adjustment after 4sec of recording start.

### Procedure)

- (1) Under the above condition, set a power supply voltage to  $5.83 \pm 0.02$ [V].
- (2) Referring to the table shown below, carry out battery voltage drop adjustment.

STEP	PROCEDURE UNDER CUT	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Make the setting shown at right. 2) Press the STORE key.	7 ↑	2 ↑	WR RD	**FF ↑	"ADJ" ↑	 *	Adjustment is completed.

## 2-7 Tape Path Adjustment

### Note)

- 1) For tape path adjustment, the service mode setting is necessary. For the details of setting procedure, refer to the DMC II Service Manual separately issued.

### Preparation)

- 1) For tape path adjustment, make the recorder adjustment setting (P. 3-2).

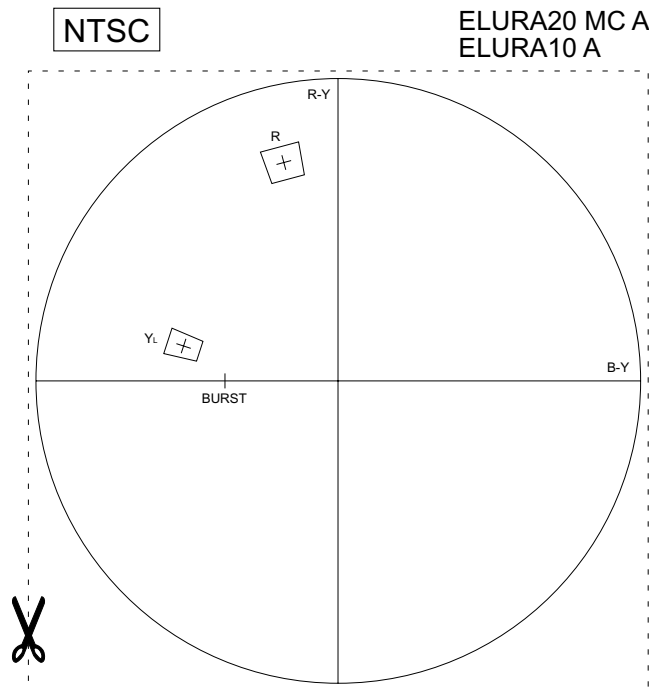
### Procedure)

- (1) Referring to the table given below, playback the alignment tape for tracking adjustment (DY9-1345-000), and carry out tape path adjustment.  
At step 2, adjust DT in a range of 01 to 0F so that the RF envelope will be 70% for tracking shift.
- (2) After adjustment, restore tracking shift to the normal condition of the product state (DT: 00).

STEP	PROCEDURE TRACKING SHIFT	MONITOR						Microcomputer operation
		PG	BK	MD	ADDR	DT	ST	
1	1) Play back the tracking tape.							
2	1) During playback, make the setting shown at right. 2) Perform 70% tracking shift by adjusting DT in a range of 01 to 0F.	7 ↑	0 ↑	WR ↑	**FE ↑	00 01~0F		Product setting Degree of tracking shift being changed.
3	1) Perform the tape path adjustment with the RF envelope in 70% tracking shift state.							

Copy the chart on a transparent film. Trim and attach the transparent chart on a vectorscope display.

## Color balance adjustment chart



# CHAPTER 5. PARTS LIST

## CONTEN

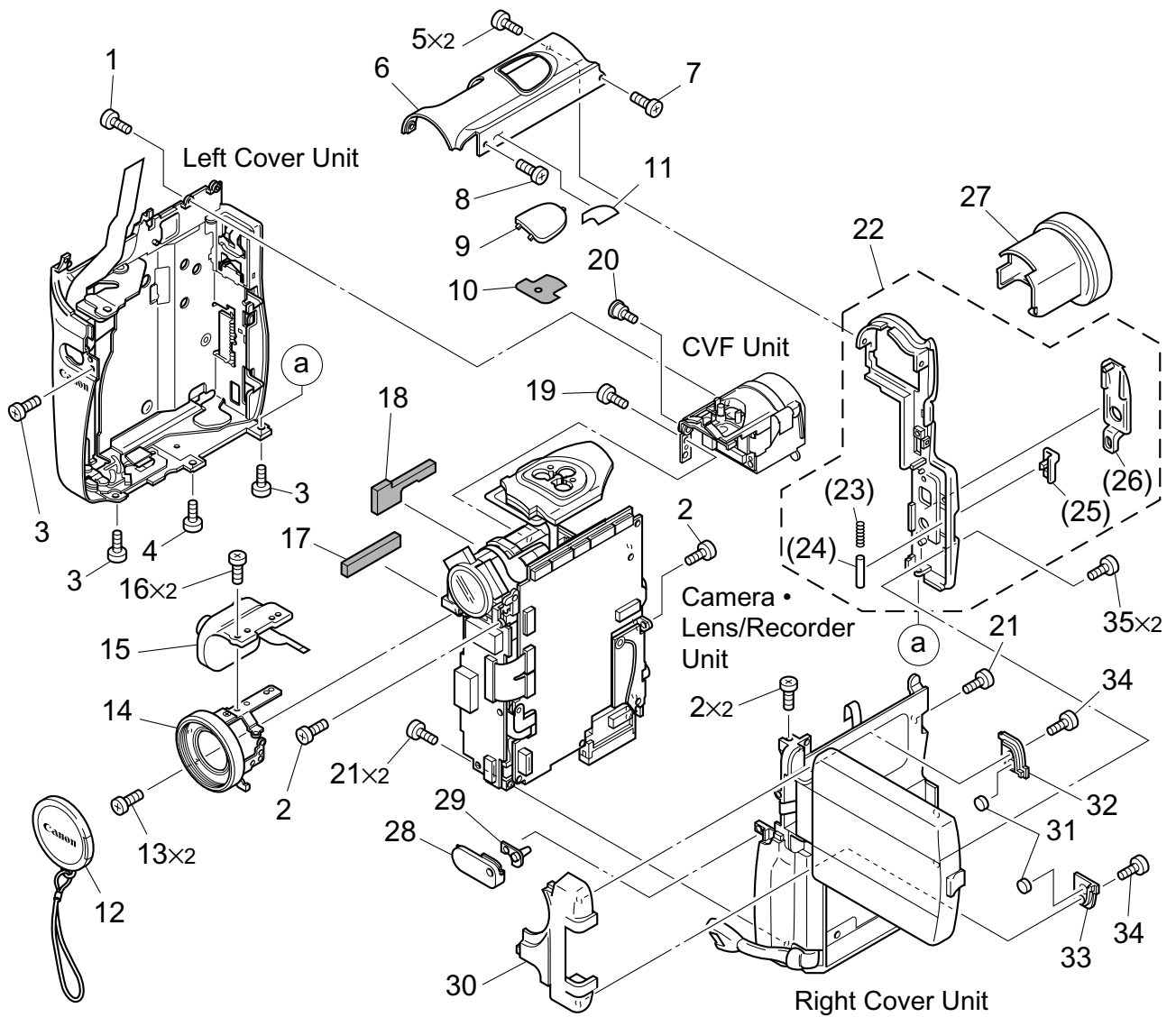
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## CAUTION

1. Especially critical parts in the power circuit block should not be replaced with other marks.  
Critical parts are marked with  $\triangle$  in this electrical parts list.

# Casing Parts Section

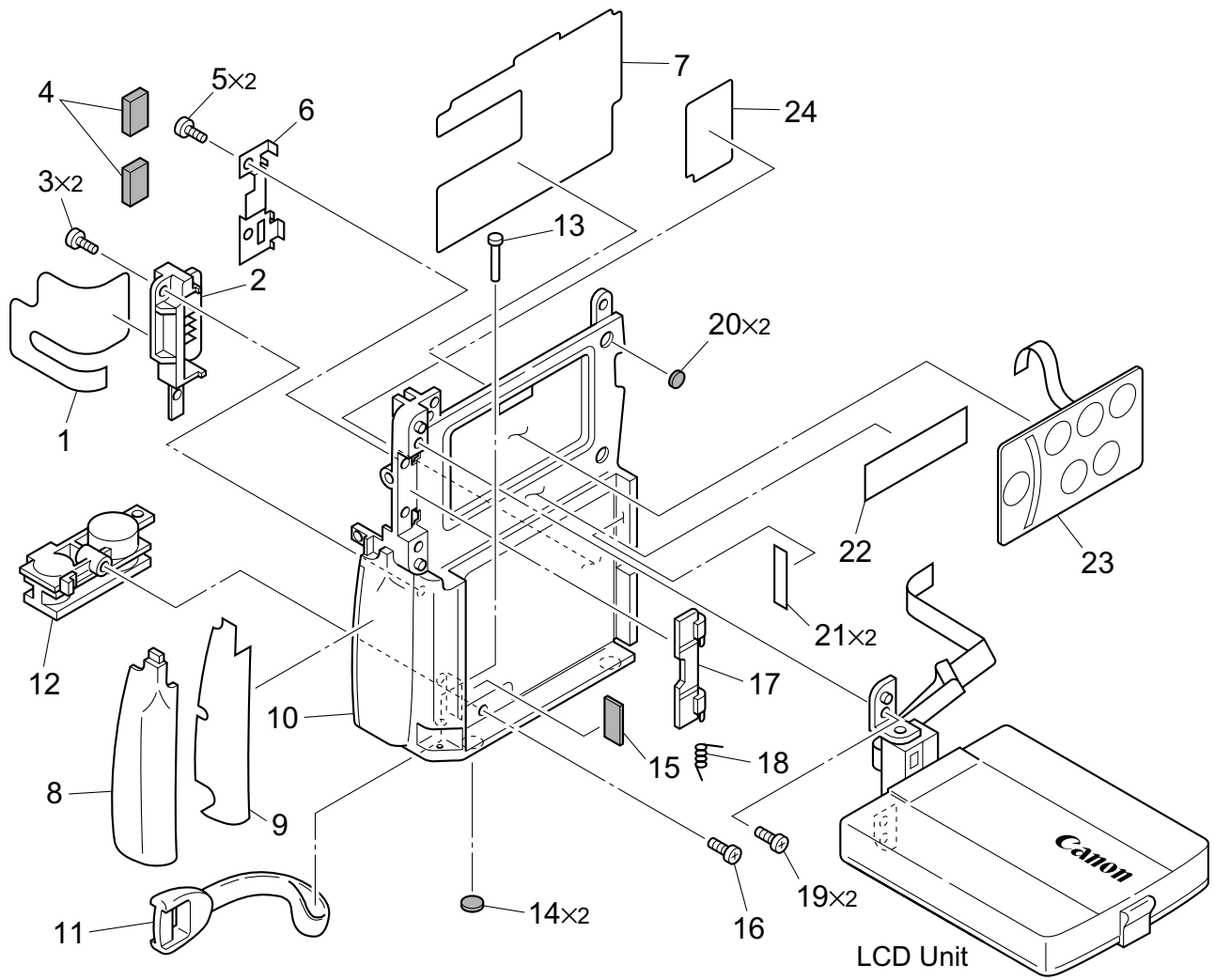




## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	XA4-9170-359 000	F	1	SCREW	
2	XA9-1001-000 000	F	4	SCREW	
3	XA1-7170-357 000	F	3	SCREW	
4	XA1-7170-407 000	F	1	SCREW	
5	DA2-1017-000 000	F	2	SCREW	
6	DA2-0931-000 000	B	1	COVER, TOP	
7	DA2-1018-000 000	F	1	SCREW	
8	DA2-1015-000 000	F	1	SCREW	
9	DA2-1473-000 000	B	1	COVER, MIC	NEW
10	DA2-0868-000 000	C	1	SHEET, MIC	
11	DA2-1021-000 000	C	1	SEAL, LCD T	
12	D52-0130-000 000	B	1	LENS CAP ASS'Y	
13	CB1-8698-000 000	F	2	SCREW	
14	DF1-1630-000 000	B	1	LENS RING ASS'Y	
15	DG1-4062-000 000	B	1	ZOOM SWITCH ASS'Y	
16	XA1-7140-207 000	F	2	SCREW	
17	DA2-1024-000 000	C	1	CUSHION	
18	DA2-1023-000 000	C	1	CUSHION	
19	XA1-7170-257 000	F	1	SCREW	
20	XA9-1244-000 000	F	1	SCREW	
21	XA1-7170-307 000	F	3	SCREW	
22	DG1-4314-000 000	B	1	REAR COVER ASS'Y	NEW
23	DS1-5387-000 000	C	1	SPRING, COIL	
24	DA2-0844-000 000	C	1	SHAFT, BATT LOCK	
25	DA2-1479-000 000	B	1	KNOB, EJECT	NEW
26	DA2-1504-000 000	B	1	COVER, AV	NEW
27	DG1-4096-000 000	B	1	EYE PIECE ASS'Y	
28	DA2-1453-000 000	B	1	COVER, REMOCON WINDOW	NEW
29	DA2-1454-000 000	B	1	COVER, TALLY WINDOW	NEW
30	DA2-1452-000 000	B	1	FRONT COVER ASS'Y	NEW
31	DA2-1020-000 000	C	2	MAGNET	
32	DA2-1465-000 000	B	1	COVER, LCD HOLDER U	NEW
33	DA2-1466-000 000	B	1	COVER, LCD HOLDER L	NEW
34	DA2-1016-000 000	F	2	SCREW	
35	DA2-1455-000 000	F	2	SCREW	NEW

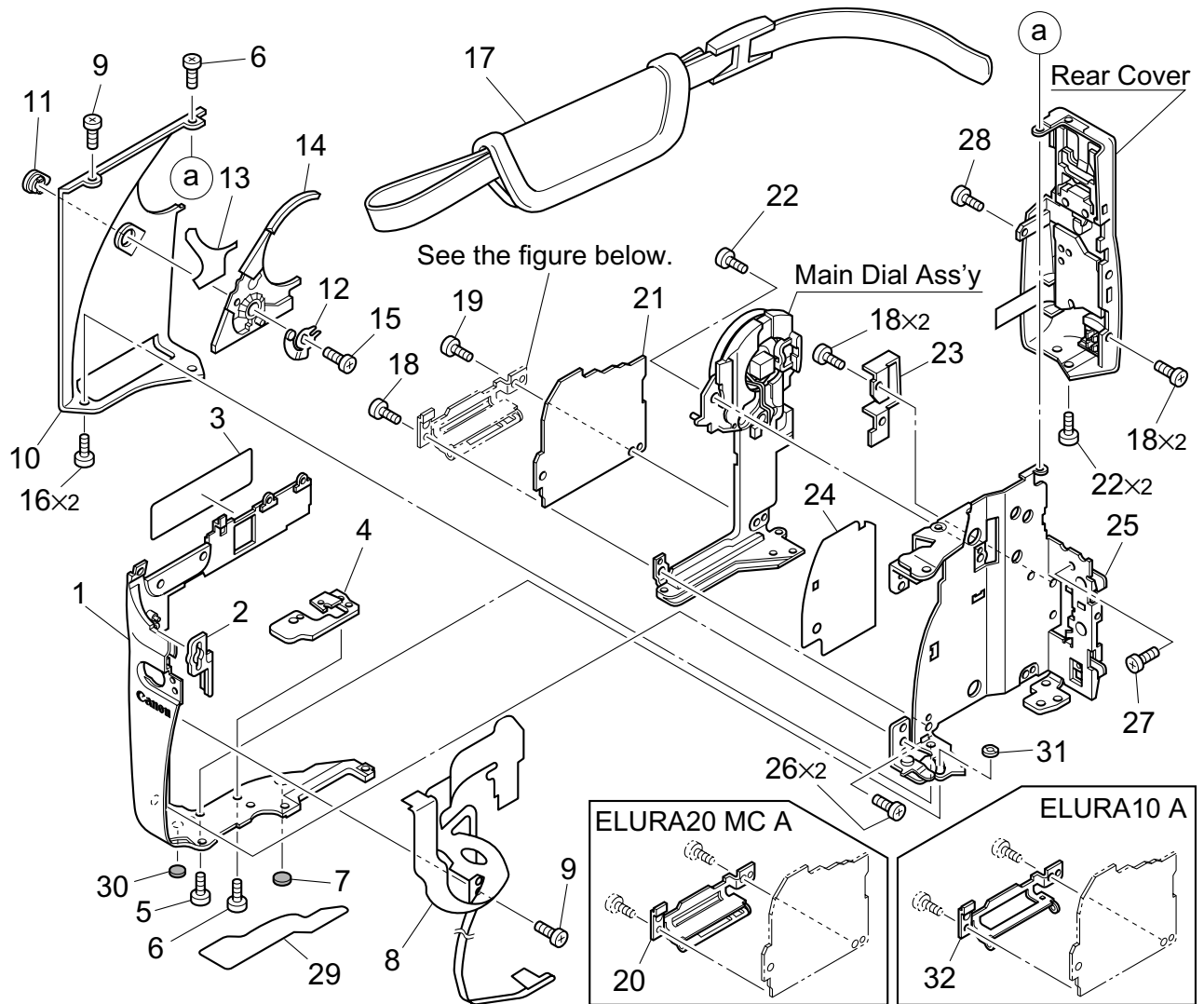
# Right Cover Unit Section



## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DH2-2183-000 000	C	1	FPC, BATTERY	
2	DG1-4079-000 000	C	1	BATTERY TERMINAL ASS'Y	
3	XA1-7170-307 000	F	2	SCREW	
4	DA2-1025-000 000	C	2	CUSHION	
5	XA9-1000-000 000	F	2	SCREW	
6	DA2-0918-000 000	C	1	PLATE, FPC	
7	DA2-1470-000 000	C	1	SHEET, INSULATION	NEW
8	DA2-1462-000 000	B	1	COVER, GRIP	NEW
9	DA2-1467-000 000	B	1	TAPE, GRIP COVER	NEW
10	DA2-1461-000 000	B	1	COVER, RIGHT	NEW
11	DA2-1472-000 000	B	1	HOLDER, HAND STRAP	NEW
12	DA2-0843-000 000	C	1	TRIPOD	
13	DA2-0842-000 000	C	1	SHAFT, GRIP BELT	
14	DA2-0845-000 000	B	2	CUSHION, R COVER	
15	DA2-1008-000 000	B	1	CUSHION, BATTERY	
16	XA4-9170-457 000	F	1	SCREW	
17	DA2-0917-000 000	B	1	COVER, FPC	
18	DS1-5380-000 000	C	1	SPRING, COIL	
19	XA1-7200-457 000	F	2	SCREW	
20	DA2-1009-000 000	B	2	CUSHION, LCD	
21	DA2-1007-000 000	B	2	SEAL, R COVER	
22	DA2-1014-000 000	B	1	LABEL, CAUTION	
23	DG1-4316-000 000	B	1	RECORDER KEY ASS'Y	NEW ELURA20 MC A
	DG1-4097-000 000	B	1	RECORDER KEY ASS'Y	ELURA10 A
24	DA2-1506-000 000	C	1	SHEET, JACK	NEW

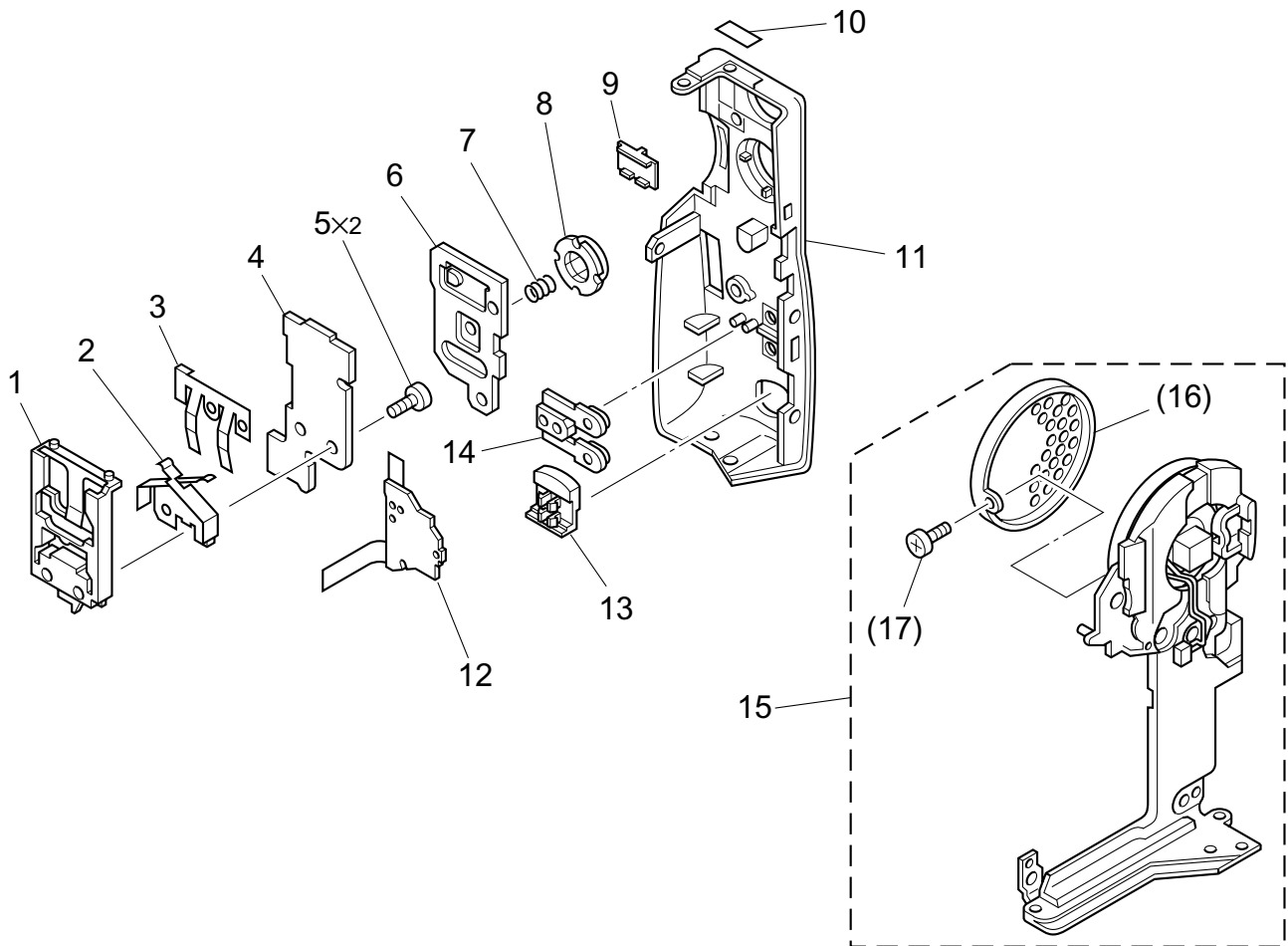
# Left Cover Unit Section



## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DA2-1451-000 000	B	1	COVER, LEFT	NEW
2	DA2-0952-000 000	C	1	HOLDER, FPC	
3	DA2-0991-000 000	B	1	LABEL, LITHIUM 2	
4	DA2-0953-000 000	C	1	HOLDER, EJECT SW	
5	XA9-1274-000 000	F	1	SCREW	
6	XA9-1001-000 000	F	2	SCREW	
7	DA2-1009-000 000	B	1	CUSHION, LCD	
8	DH2-4055-000 000	C	1	FPC, MMC-MAIN	
9	XA9-1000-000 000	F	2	SCREW	
10	DA2-0980-000 000	B	1	COVER, CARD	ELURA20 MC A
	DA2-0981-000 000	B	1	COVER, CARD	ELURA10 A
11	DA2-0950-000 000	B	1	KNOB, P.SCAN	
12	DA2-0881-000 000	C	1	SPRING, PLATE	
13	DA2-0883-000 000	C	1	TAPE, C COVER	
14	DA2-0944-000 000	B	1	PLATE, DIAL	
15	XA4-9140-287 000	F	1	SCREW	
16	XA9-1002-000 000	F	2	SCREW	
17	DA2-1471-000 000	B	1	STRAP, HAND	NEW
18	XA1-7170-207 000	F	5	SCREW	
19	XA1-7170-357 000	F	1	SCREW	
20	DG1-4078-000 000	B	1	COVER ASS'Y, MMC	ELURA20 MC A
21	DG1-4289-000 000	C	1	PCB ASS'Y, MMC	NEW ELURA20 MC A
	DG1-4290-000 000	C	1	PCB ASS'Y, MMC	NEW ELURA10 A
22	XA1-7170-257 000	F	3	SCREW	
23	DA2-0994-000 000	B	1	HOLDER, GRIP BELT	
24	DA2-0993-000 000	C	1	SHEET, MMC	
25	DF1-1624-000 000	C	1	CASSETTE ARM ASS'Y	
26	XA1-7170-307 000	F	2	SCREW	
27	XA9-1004-000 000	F	1	SCREW	
28	XA1-7170-607 000	F	1	SCREW	
29	DA2-0986-000 000	B	1	LABEL, CAUTION	NEW
30	DA2-0845-000 000	B	1	CUSHION, R COVER	
31	DA2-1156-000 000	C	1	GUIDE, C ARM	NEW
32	DA2-0967-000 000	C	1	COVER, SD HOLDER	NEW ELURA10 A

## Main Dial/Rear Cover Section



## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DA2-0978-000 000	C	1	HOLDER, LITHIUM	
2	DA2-0976-000 000	C	1	LITHIUM TERMINAL +	
3	DA2-0977-000 000	C	1	LITHIUM TERMINAL -	
4	DG1-4029-000 000	C	1	PCB ASS'Y, LITHIUM	
5	XA9-1004-000 000	F	2	SCREW	
6	DA2-0974-000 000	C	1	HOLDER, TRIGGER	
7	DS1-5385-000 000	C	1	SPRING, COIL	
8	DA2-0973-000 000	B	1	KEY, TRIGGER	
9	DA2-1486-000 000	B	1	KNOB, AP	NEW
10	DA2-0990-000 000	B	1	LABEL, LITHIUM 1	
11	DA2-1483-000 000	B	1	COVER, CASSETTE REAR	NEW
12	DG1-4054-000 000	C	1	FPC ASS'Y, FE	
13	DA2-1485-000 000	B	1	KNOB, OPEN	NEW
14	DA2-1487-000 000	B	1	KNOB, FE	NEW
15	DG1-4309-000 000	B	1	MAIN DIAL ASS'Y	NEW ELURA20 MC A
	DG1-4312-000 000	B	1	MAIN DIAL ASS'Y	NEW ELURA10 A
16	DA2-1474-000 000	B	1	COVER, M DIAL	NEW ELURA20 MC A
	DA2-1477-000 000	B	1	COVER, M DIAL	NEW ELURA10 A
17	XA9-1252-000 000	F	1	SCREW	

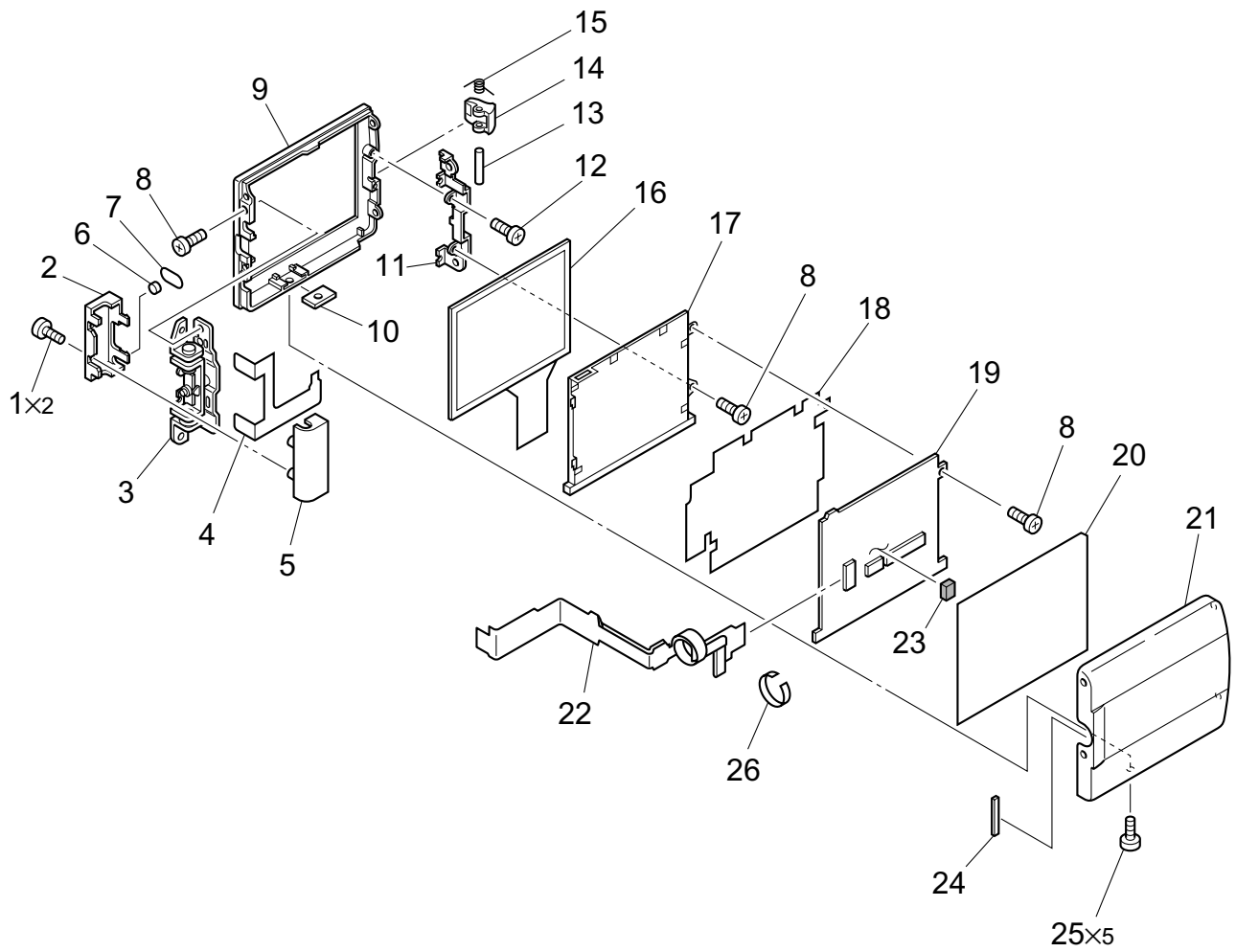




## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DY1-8282-000 000	C	1	RECORDER UNIT DMC II	
2	DA1-9796-000 000	B	1	LABEL, CASSETTE	
3	DA1-9903-000 000	B	1	LABEL, S CHASSIS	
4	DA2-0859-000 000	C	1	HOLDER, RECORDER	
5	DY1-8273-000 000	C	1	PCB ASS'Y, SUB	
6	XA1-7170-257 000	F	8	SCREW	
7	DA2-0860-000 000	C	1	RUBBER, INSULATION	
8	DA2-1151-000 000	C	1	CUSHION	
9	DA2-0897-000 000	C	1	SHEET, INSULATION	
10	DA2-1152-000 000	C	1	CUSHION	
11	DA1-9788-000 000	F	1	WASHER	
12	XA9-1260-000 000	F	1	SCREW	
13	DA1-9779-000 000	C	2	RUBBER, INSULATION	
14	XA9-1167-000 000	F	2	SCREW	
15	XA9-1001-000 000	F	1	SCREW	
16	DA2-0896-000 000	C	2	RUBBER, INSULATION	
17	XA9-1244-000 000	F	2	SCREW	
18	DA2-0880-000 000	C	1	SHEET, INSULATION	
19	DA2-1028-000 000	C	1	SHEET, AUDIO 2	
20	DG1-4023-050 000	C	1	PCB ASS'Y, AUDIO	NEW
21	DG1-4056-000 000	C	1	MIC ASS'Y	
22	DA2-0997-000 000	C	1	SHEET, MIC FPC	
23	DA2-0867-000 000	C	1	RUBBER, MIC	
24	DA2-0858-000 000	C	1	RUBBER, INSULATION	
25	DH2-2174-000 000	C	1	FPC ASS'Y, MULTI-AUDIO	
26	DY1-8379-000 000	C	1	PCB ASS'Y, MAIN	NEW ELURA20 MC A
	DY1-8381-000 000	C	1	PCB ASS'Y, MAIN	NEW ELURA10 A
27	DA2-0863-000 000	C	1	CASE, SHIELD MAIN 1	
28	DH2-2175-000 000	C	1	FPC ASS'Y, SUB-MAIN	
29	DH2-2182-000 000	C	1	FPC ASS'Y, HA SHIELD	
30	DA2-1158-000 000	C	1	SHEET, SDRAM	
31	DA2-1027-000 000	C	1	SHEET, AUDIO 1	
32	DA2-0865-000 000	C	1	CASE, SHIELD MAIN 2	
33	DA2-0846-000 000	C	1	SHEET, MAIN	
34	DG1-4028-000 000	C	1	PCB ASS'Y, MULTI	
35	DA2-0855-000 000	C	1	PLATE, GND	
36	DA2-0832-000 000	C	1	HOLDER, MULTI	
37	DG1-4051-000 000	C	1	FPC ASS'Y, JACK	
38	DG1-3978-000 000	C	1	FPC ASS'Y SUB-DMC	
39	DA2-0895-000 000	B	1	LABEL, FUSE	NEW

## LCD Unit Section



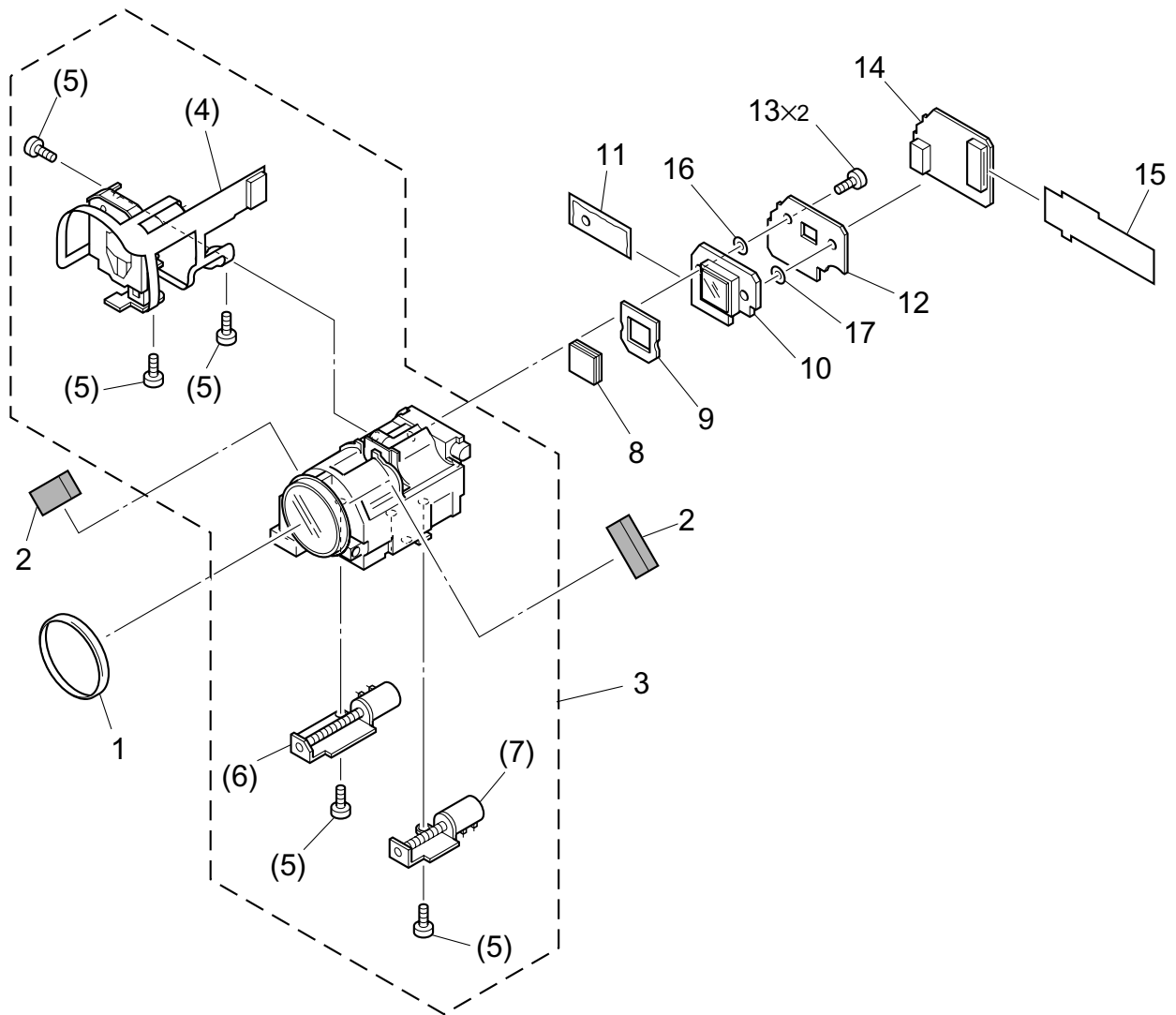
## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
	1 XA4-9170-409 000	F	2	SCREW	
	2 DA2-0915-000 000	B	1	COVER, HINGE L	
	3 DG1-4065-000 000	C	1	HINGE ASS'Y, LCD	
	4 DG1-4052-000 000	C	1	FPC ASS'Y, LCD SW	
	5 DA2-0914-000 000	B	1	COVER, HINGE R	
	6 DA2-1020-000 000	C	1	MAGNET	
	7 DA2-1019-000 000	B	1	SEAL, MAGNET	
	8 XA1-7170-257 000	F	3	SCREW	
	9 DA2-1464-000 000	B	1	COVER, LCD BOTTOM	NEW
	10 DA2-0907-000 000	C	1	PLATE, LCD2	
	11 DA2-0906-000 000	C	1	PLATE, LCD1	
	12 XA4-9170-359 000	F	1	SCREW	
	13 DA2-0909-000 000	C	1	SHAFT, LCD LOCK	
	14 DA2-0908-000 000	B	1	KNOB, LCD	
	15 DS1-5380-000 000	C	1	SPRING, COIL	
*1	16 DH9-0831-000 000	C	1	LCD ASS'Y	
*2	DY1-8274-000 000	C	1	LCD ASS'Y	
	17 DG1-7377-000 000	C	1	BACKLIGHT ASS'Y (LCD)	
	18 DA2-0910-000 000	C	1	SHEET, LCD1	
	19 DG1-4024-000 000	C	1	PCB ASS'Y, LCD	
	20 DA2-0911-000 000	C	1	SHEET, LCD2	
	21 DA2-1463-000 000	B	1	COVER, LCD TOP	NEW ELURA20 MC A
	DA2-1498-000 000	B	1	COVER, LCD TOP	NEW ELURA10 A
	22 DH2-2177-000 000	C	1	FPC, LCD-MAIN	
	23 DA2-0912-000 000	C	1	CUSHION	
	24 DA2-1012-000 000	C	1	SHEET, FPC	
	25 DA2-1015-000 000	F	5	SCREW	
	26 DA2-1160-000 000	B	1	SHEET, LCD FPC	

\*1 : Same quality as the production line.

\*2 : Free from the pixel dot.

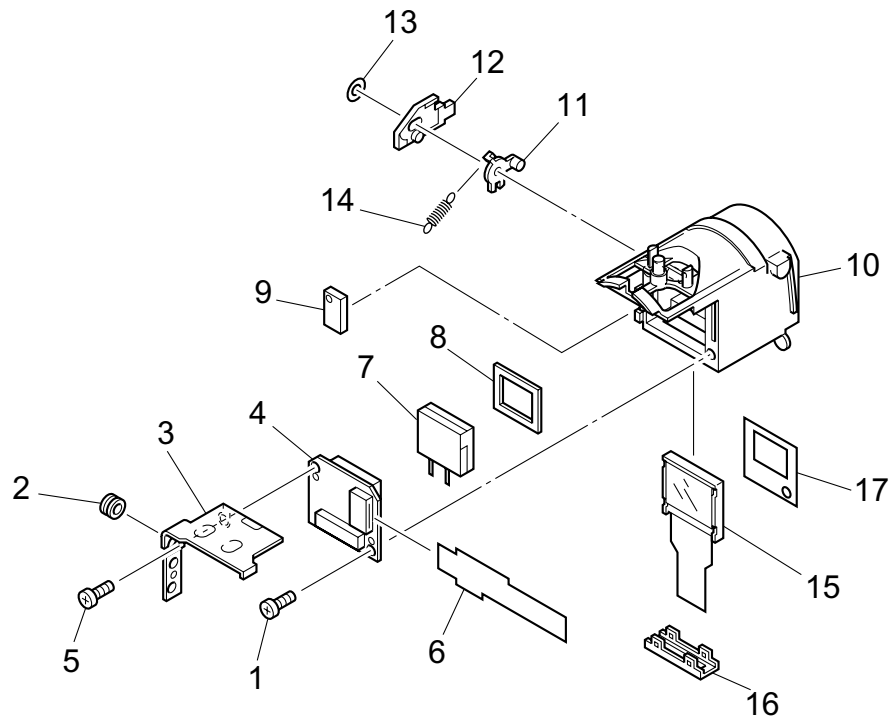
## Camera · Lens Unit Section



## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DA2-0945-000 000	C	1	RUBBER, LENS	
2	DA2-1026-000 000	C	2	CUSHION	
3	DG1-4066-000 000	C	1	LENS ASS'Y	
4	YH8-0097-000 000	C	1	IG METER ASS'Y	
5	XA4-9170-407 000	F	5	SCREW	
6	YH7-0200-000 000	C	1	MOTOR, PZ	
7	YH7-0201-000 000	C	1	MOTOR, AF	
8	DH9-0836-000 000	C	1	FILTER, IR	
9	DA2-0862-000 000	C	1	RUBBER, INSULATION	
10	DY1-8271-000 000	C	1	CCD ASS'Y	
11	DA2-0899-000 000	C	1	PLATE, GRAPHITE CCD	
12	DG1-4025-000 000	C	1	PCB ASS'Y, CCD	
13	XA4-9170-609 000	F	2	SCREW	
14	DG1-4026-000 000	C	1	PCB ASS'Y, CA	
15	DH2-2178-000 000	C	1	FPC ASS'Y, CA-MAIN	
16	DA2-1159-000 000	F	1	WASHER	
17	XD1-1101-825 000	F	1	WASHER	

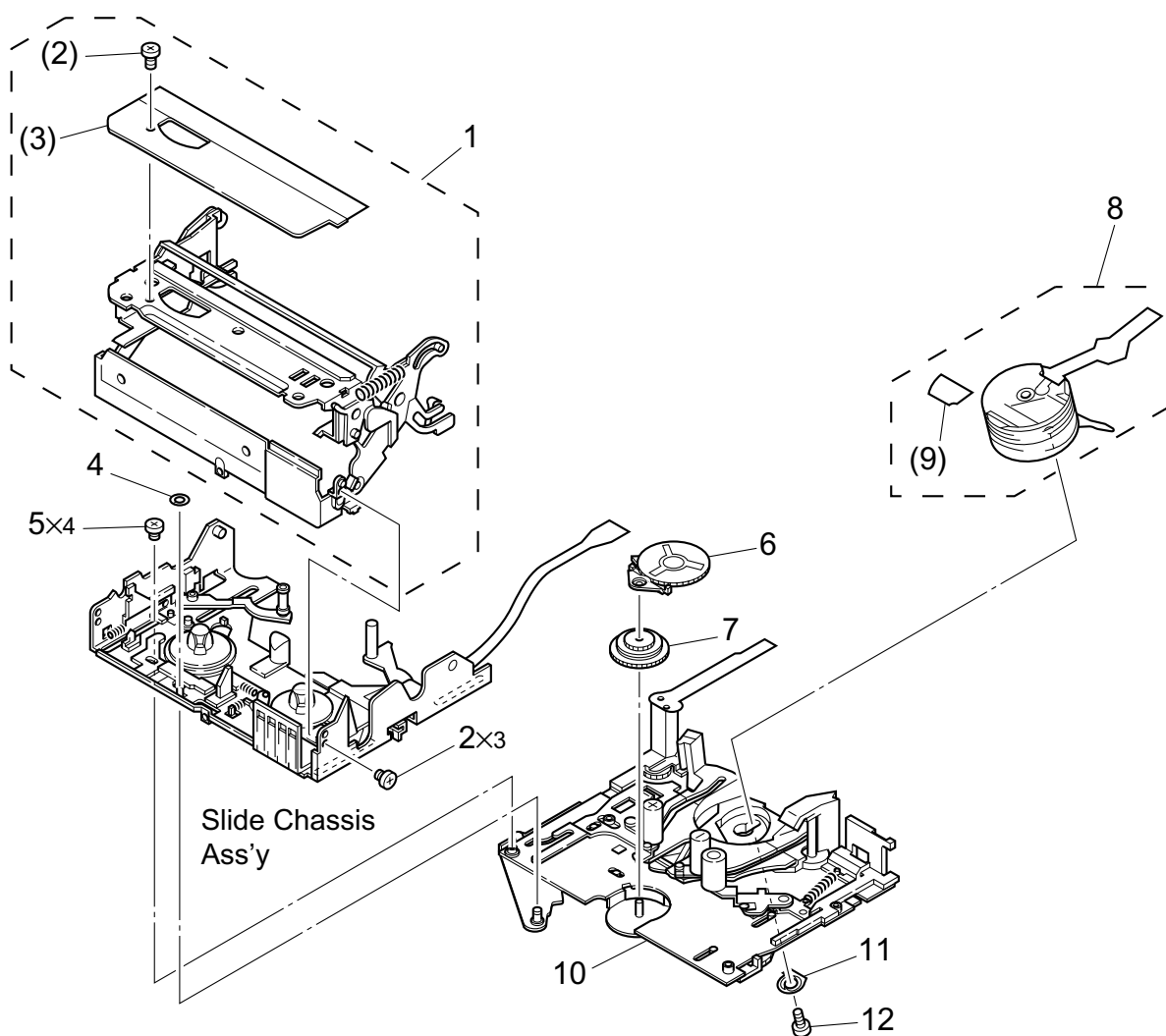
## CVF Unit Section



## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	XA4-9170-309 000	F	1	SCREW	
2	DA2-0896-000 000	C	1	RUBBER, INSULATION	
3	DA2-0869-000 000	C	1	PLATE, CVF	
4	DG1-4027-000 000	C	1	PCB ASS'Y, CVF	
5	XA4-9170-357 000	F	1	SCREW	
6	DH2-2179-000 000	C	1	FPC ASS'Y, CVF-MAIN	
7	DG1-4067-000 000	C	1	BACKLIGHT ASS'Y (CVF)	
8	DA2-0884-000 000	C	1	CUSHION	
9	DA2-0885-000 000	C	1	RUBBER, INSULATION	
10	DA2-0870-000 000	C	1	HOLDER, CVF	
11	DF1-1628-000 000	C	1	CVF LEVER ASS'Y	
12	DA2-0877-000 000	C	1	PLATE, FINDER RELEASE	
13	CB1-5509-000 000	F	1	NUT, ONEWAY GEAR	
14	DS1-5386-000 000	C	1	SPRING, COIL	
15	WG2-5194-000 000	C	1	LCD ASS'Y, CVF	
16	DA2-0873-000 000	C	1	PLATE, LCD STOPPER	
17	DA1-9760-000 000	C	1	PLATE, MASK	

## Mechanical Chassis Section-1

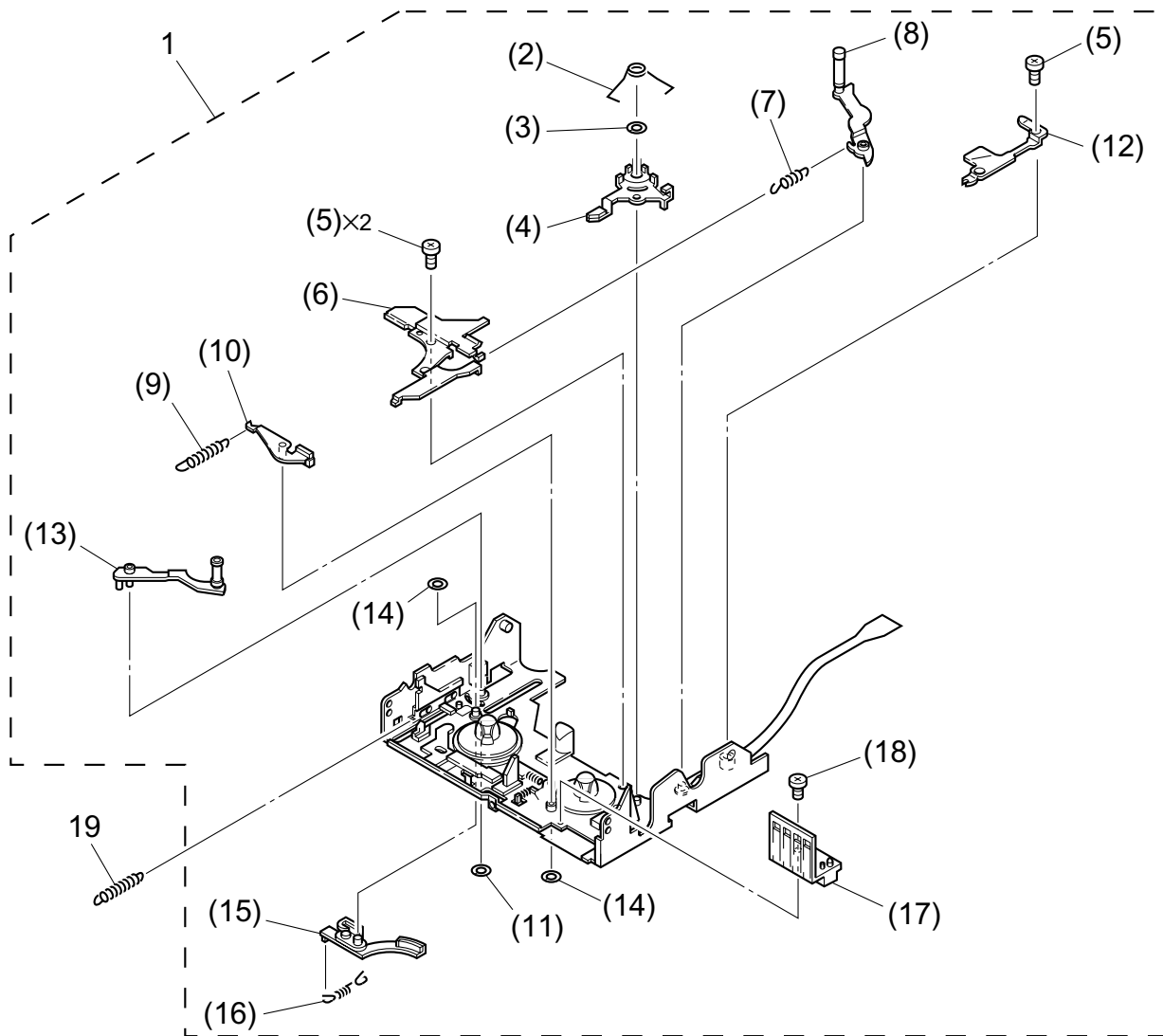




## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DG1-3861-000 000	C	1	CASSETTE HOLDER ASS'Y	
2	DA2-0642-000 000	F	4	SCREW	
3	DF1-1569-000 000	C	1	CASSETTE COVER ASS'Y	
4	DA2-0646-000 000	F	1	WASHER	
5	DA2-0643-000 000	F	4	SCREW	
6	DF1-1514-000 000	C	1	IDLER GEAR ASS'Y	
7	DG1-3857-000 000	C	1	DRIVE GEAR ASS'Y	
8	DY1-8283-000 000	E	1	DRUM ASS'Y (3CH)	
9	DA2-0793-000 000	C	1	PLATE, TAPE GUIDE	
10	DY1-8210-000 000	C	1	MAIN CHASSIS ASS'Y	
11	DA2-0758-000 000	C	1	SPRING, PLATE	
12	DA2-0757-000 000	F	1	SCREW	

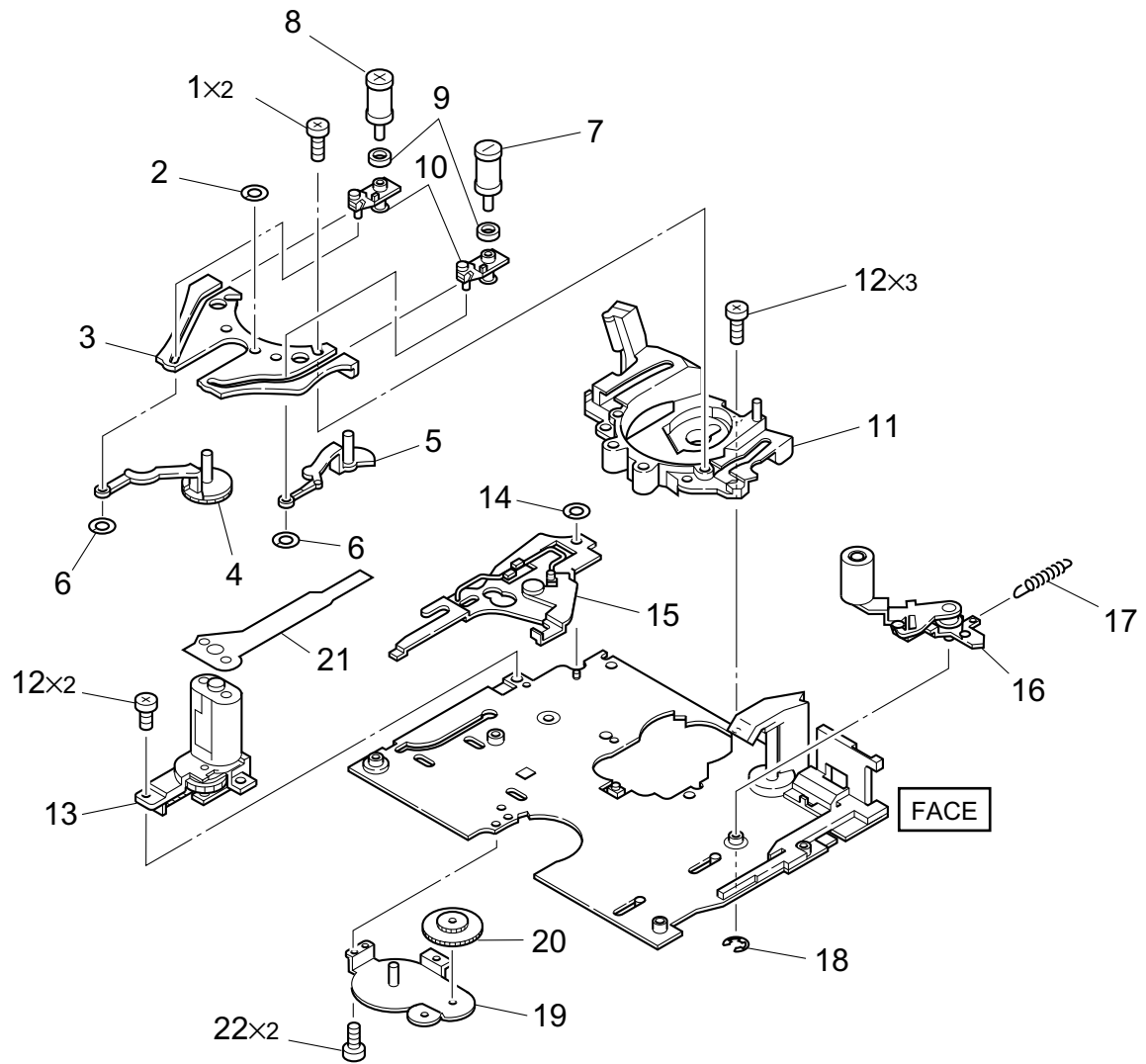
## Mechanical Chassis Section-2



## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DY1-8211-000 000	C	1	SLIDE CHASSIS ASS'Y	
2	DA2-0712-000 000	C	1	SPRING, COIL	
3	DA2-0646-000 000	F	1	WASHER	
4	DA2-0703-000 000	C	1	EJECT LEVER	
5	DA2-0642-000 000	F	3	SCREW	
6	DA2-0661-000 000	C	1	COVER, PINCH ROLLER	
7	DS1-0175-000 000	C	1	SPRING, COIL	
8	DG1-3859-000 000	C	1	REVIEW ARM ASS'Y	
9	DS1-0172-000 000	C	1	SPRING, COIL	
10	DF1-1566-000 000	C	1	BRAKE, T SUB	
11	DA2-0782-000 000	F	1	WASHER	
12	DA2-0660-000 000	C	1	COVER, REVIEW ARM	
13	DF1-1548-000 000	C	1	TENSION ARM ASS'Y	
14	DA2-0645-000 000	F	2	WASHER	
15	DF1-1549-000 000	C	1	TENSION BRAKE ASS'Y	
16	DS1-0169-000 000	C	1	SPRING, COIL	
17	DH9-0812-000 000	C	1	TAPE DETECTION SW ASS'Y	
18	DA2-0643-000 000	F	1	SCREW	
19	DS1-0173-000 000	C	1	SPRING, COIL	

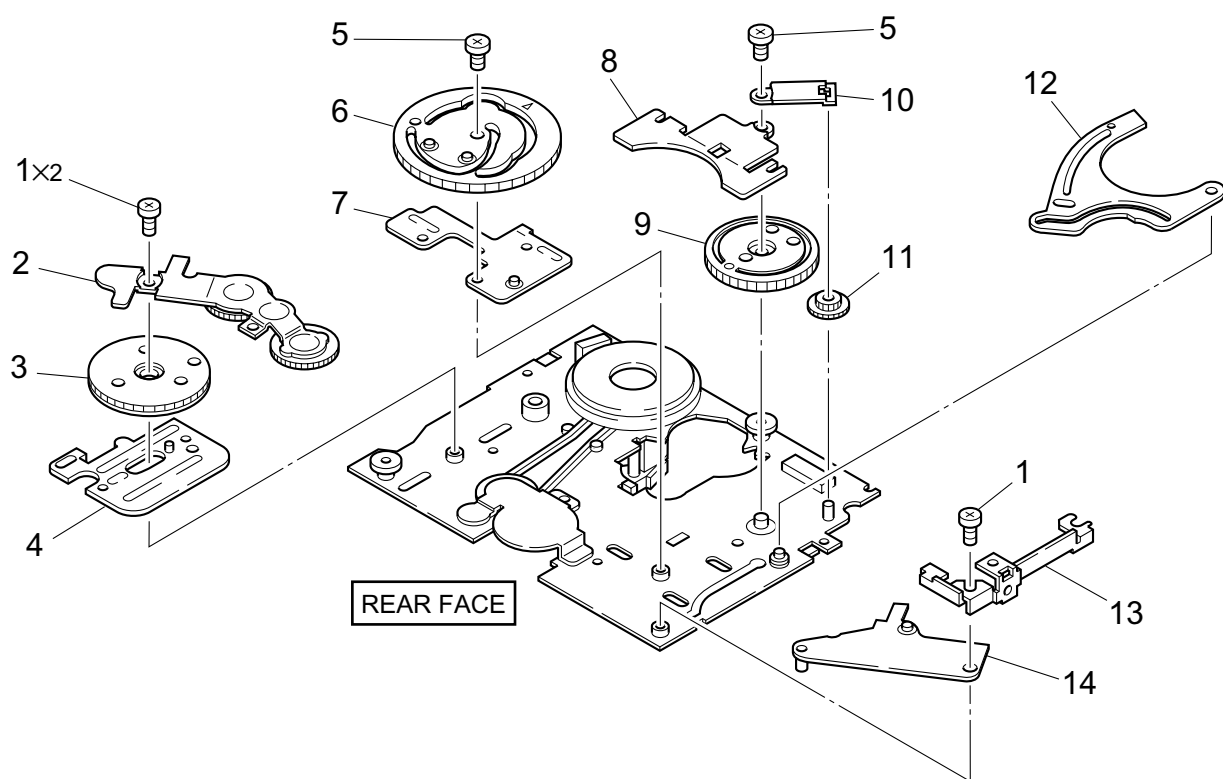
## Mechanical Chassis Section-3



## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DA2-0780-000 000	F	2	SCREW	
2	DA2-0645-000 000	F	1	WASHER	
3	DA2-0747-000 000	C	1	GUIDE RAIL	
4	DF1-1546-000 000	C	1	ARM ASS'Y, S	
5	DF1-1547-000 000	C	1	ARM ASS'Y, T	
6	DA2-0781-000 000	F	2	WASHER	
7	DF1-1544-000 000	C	1	T GUIDE ROLLER ASS'Y	
8	DF1-1550-000 000	C	1	S GUIDE ROLLER ASS'Y	
9	DA2-0774-000 000	C	2	POST RING, RUBBER	
10	DF1-1545-000 000	C	2	SKATE ASS'Y	
11	DF1-1551-000 000	C	1	DRUM BASE ASS'Y	
12	DA2-0644-000 000	F	5	SCREW	
13	DG1-3865-000 000	C	1	LOADING MOTOR ASS'Y	
14	DA2-0646-000 000	F	1	WASHER	
15	DF1-1567-000 000	C	1	LEVER ASS'Y, S MODE	
16	DG1-3858-000 000	C	1	ARM ASS'Y, PINCH ROLLER	
17	DS1-0174-000 000	C	1	SPRING, COIL	
18	XD2-1100-102 000	C	1	E RING	
19	DF1-1517-000 000	C	1	PLATE, DRIVE GEAR	
20	DA2-0586-000 000	C	1	GEAR, CP	
21	DH2-2115-000 000	C	1	FPC, LOADING MOTOR	
22	XA1-7140-147 000	F	2	SCREW	

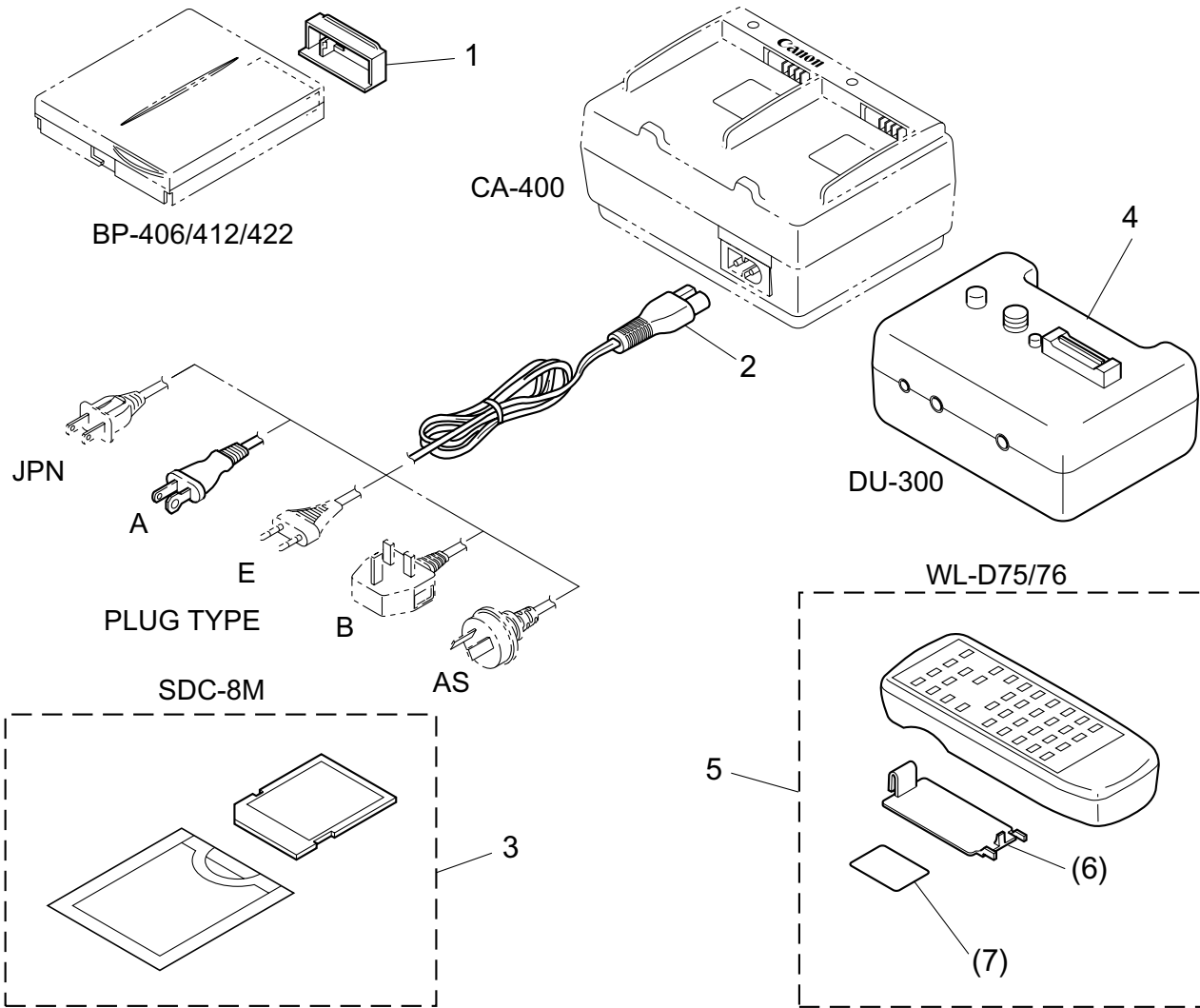
## Mechanical Chassis Section-4



## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	XA1-7140-147 000	F	3	SCREW	
2	DF1-1525-000 000	C	1	GEAR ASS'Y, TRANS.	
3	DA2-0590-000 000	C	1	GEAR, CAM 2	
4	DF1-1520-000 000	C	1	LEVER ASS'Y, PR CONTROL	
5	DA2-0643-000 000	F	2	SCREW	
6	DF1-1516-000 000	C	1	GEAR, CAM 1	
7	DF1-1518-000 000	C	1	LEVER ASS'Y, MODE	
8	DA2-0640-000 000	C	1	COVER, MODE GEAR	
9	DG1-3860-000 000	C	1	GEAR, MODE	
10	DA2-0666-000 000	C	1	COVER, LM GEAR	
11	DA2-0604-000 000	C	1	GEAR, LM	
12	DA2-0630-000 000	C	1	LEVER, LOAD	
13	DA2-0638-000 000	C	1	HOLDER, SLIDE LEVER	
14	DF1-1522-000 000	C	1	LEVER, SLIDE	

Accessory Section





## MECHANICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
1	DY1-8276-000 000	C	1	COVER, TERMINAL BP-406	
2	D82-0642-000 000	C	1	CORD, AC (A)	
3	DY1-8383-000 000	C	1	CARD, SD SDC-8M	ELURA20 MC A
4	D82-0660-000 000	C	1	DOCKING UNIT DU-300	
5	D83-0562-000 000	C	1	WL-D75A WIRELESS CONTROLLER	ELURA20 MC A
	D83-0572-000 000	C	1	WL-D76A WIRELESS CONTROLLER	ELURA10 A
6	DY1-8121-000 000	C	1	COVER, BATTERY	
7	DY1-8119-000 000	C	1	LABEL, WIRELESS CONTROLLER (A)	

## ELECTRICAL PARTS

SYMBOL	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
	CN100 VS1-6640-027 000	C	1	CONNECTOR, 27P	
	CN101 VS1-6640-025 000	C	1	CONNECTOR, 25P	
	CN102 VS1-6674-005 000	C	1	CONNECTOR, 5P	
	CN200 VS1-6640-027 000	C	1	CONNECTOR, 27P	
	CN1401 VS1-6674-006 000	C	1	CONNECTOR, 6P	
	CN1402 VS1-6640-031 000	C	1	CONNECTOR, 31P	
	CN1501 VS1-6640-021 000	C	1	CONNECTOR, 21P	
	CN1502 VS1-6640-027 000	C	1	CONNECTOR, 27P	
	CN3201 VS1-6307-014 000	C	1	CONNECTOR, 14P	
	CN3202 VS1-6640-027 000	C	1	CONNECTOR, 27P	
	CN3401 WS1-5879-000 000	C	1	CONNECTOR, DV	
△	FU3201 WD1-5062-000 000	D	1	FUSE	
△	FU3202 WD1-5062-000 000	D	1	FUSE	
	JC WS1-5524-000 000	C	1	JACK, A/V	
	SW WC4-5155-000 000	C	1	SWITCH, TRIGGER	
	SW101 WC5-5134-000 000	C	1	SWITCH, DIAL	

## PARTS LIST

PAGE	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
17	CB1-5509-000 000	F	1	NUT, ONEWAY GEAR	
3	CB1-8698-000 000	F	2	SCREW	
3	D52-0130-000 000	B	1	LENS CAP ASS'Y	
27	D82-0642-000 000	C	1	CORD, AC(A)	
27	D82-0660-000 000	C	1	DOCKING UNIT DU-300	
27	D83-0562-000 000	C	1	WL-D75A WIRELESS CONTROLLER	ELURA20 MC A
27	D83-0572-000 000	C	1	WL-D76A WIRELESS CONTROLLER	ELURA10 A
17	DA1-9760-000 000	C	1	PLATE, MASK	
11	DA1-9779-000 000	C	2	RUBBER, INSULATION	
11	DA1-9788-000 000	F	1	WASHER	
11	DA1-9796-000 000	B	1	LABEL, CASSETTE	
11	DA1-9903-000 000	B	1	LABEL, S CHASSIS	
23	DA2-0586-000 000	C	1	GEAR, CP	
25	DA2-0590-000 000	C	1	GEAR, CAM 2	
25	DA2-0604-000 000	C	1	GEAR, LM	
25	DA2-0630-000 000	C	1	LEVER, LOAD	
25	DA2-0638-000 000	C	1	HOLDER, SLIDE LEVER	
25	DA2-0640-000 000	C	1	COVER, MODE GEAR	
19,21	DA2-0642-000 000	F	7	SCREW	
19,21,25	DA2-0643-000 000	F	7	SCREW	
23	DA2-0644-000 000	F	5	SCREW	
21,23	DA2-0645-000 000	F	3	WASHER	
19,21,23	DA2-0646-000 000	F	3	WASHER	
21	DA2-0660-000 000	C	1	COVER, REVIEW ARM	
21	DA2-0661-000 000	C	1	COVER, PINCH ROLLER	
25	DA2-0666-000 000	C	1	COVER, LM GEAR	
21	DA2-0703-000 000	C	1	EJECT LEVER	
21	DA2-0712-000 000	C	1	SPRING, COIL	
23	DA2-0747-000 000	C	1	GUIDE RAIL	
19	DA2-0757-000 000	F	1	SCREW	
19	DA2-0758-000 000	C	1	SPRING, PLATE	
23	DA2-0774-000 000	C	2	POST RING, RUBBER	
23	DA2-0780-000 000	F	2	SCREW	
23	DA2-0781-000 000	F	2	WASHER	
21	DA2-0782-000 000	F	1	WASHER	
19	DA2-0793-000 000	C	1	PLATE, TAPE GUIDE	
11	DA2-0832-000 000	C	1	HOLDER, MULTI	
5	DA2-0842-000 000	C	1	SHAFT, GRIP BELT	
5	DA2-0843-000 000	C	1	TRIPOD	
3	DA2-0844-000 000	C	1	SHAFT, BATT LOCK	
5,7	DA2-0845-000 000	B	3	CUSHION, R COVER	
11	DA2-0846-000 000	C	1	SHEET, MAIN	
11	DA2-0855-000 000	C	1	PLATE, GND	
11	DA2-0858-000 000	C	1	RUBBER, INSULATION	
11	DA2-0859-000 000	C	1	HOLDER, RECORDER	
11	DA2-0860-000 000	C	1	RUBBER, INSULATION	
15	DA2-0862-000 000	C	1	RUBBER, INSULATION	
11	DA2-0863-000 000	C	1	CASE, SHIELD MAIN 1	
11	DA2-0865-000 000	C	1	CASE, SHIELD MAIN 2	
11	DA2-0867-000 000	C	1	RUBBER, MIC	
3	DA2-0868-000 000	C	1	SHEET, MIC	
17	DA2-0869-000 000	C	1	PLATE, CVF	
17	DA2-0870-000 000	C	1	HOLDER, CVF	
17	DA2-0873-000 000	C	1	PLATE, LCD STOPPER	
17	DA2-0877-000 000	C	1	PLATE, FINDER RELEASE	
11	DA2-0880-000 000	C	1	SHEET, INSULATION	
7	DA2-0881-000 000	C	1	SPRING, PLATE	
7	DA2-0883-000 000	C	1	TAPE, C COVER	
17	DA2-0884-000 000	C	1	CUSHION	
17	DA2-0885-000 000	C	1	RUBBER, INSULATION	

## PARTS LIST

PAGE	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
11	DA2-0895-000 000	B	1	LABEL, FUSE	NEW
11,17	DA2-0896-000 000	C	3	RUBBER, INSULATION	
11	DA2-0897-000 000	C	1	SHEET, INSULATION	
15	DA2-0899-000 000	C	1	PLATE, GRAPHITE CCD	
13	DA2-0906-000 000	C	1	PLATE, LCD1	
13	DA2-0907-000 000	C	1	PLATE, LCD2	
13	DA2-0908-000 000	B	1	KNOB, LCD	
13	DA2-0909-000 000	C	1	SHAFT, LCD LOCK	
13	DA2-0910-000 000	C	1	SHEET, LCD1	
13	DA2-0911-000 000	C	1	SHEET, LCD2	
13	DA2-0912-000 000	C	1	CUSHION	
13	DA2-0914-000 000	B	1	COVER, HINGE R	
13	DA2-0915-000 000	B	1	COVER, HINGE L	
5	DA2-0917-000 000	B	1	COVER, FPC	
5	DA2-0918-000 000	C	1	PLATE, FPC	
3	DA2-0931-000 000	B	1	COVER, TOP	
7	DA2-0944-000 000	B	1	PLATE, DIAL	
15	DA2-0945-000 000	C	1	RUBBER, LENS	
7	DA2-0950-000 000	B	1	KNOB, P.SCAN	
7	DA2-0952-000 000	C	1	HOLDER, FPC	
7	DA2-0953-000 000	C	1	HOLDER, EJECT SW	
7	DA2-0967-000 000	C	1	COVER, SD HOLDER	NEW ELURA10 A
9	DA2-0973-000 000	B	1	KEY, TRIGGER	
9	DA2-0974-000 000	C	1	HOLDER, TRIGGER	
9	DA2-0976-000 000	C	1	LITHIUM TERMINAL +	
9	DA2-0977-000 000	C	1	LITHIUM TERMINAL -	
9	DA2-0978-000 000	C	1	HOLDER, LITHIUM	
7	DA2-0980-000 000	B	1	COVER, CARD	ELURA20 MC A
7	DA2-0981-000 000	B	1	COVER, CARD	
7	DA2-0986-000 000	B	1	LABEL, CAUTION	NEW
9	DA2-0990-000 000	B	1	LABEL, LITHIUM 1	
7	DA2-0991-000 000	B	1	LABEL, LITHIUM 2	
7	DA2-0993-000 000	C	1	SHEET, MMC	
7	DA2-0994-000 000	B	1	HOLDER, GRIP BELT	
11	DA2-0997-000 000	C	1	SHEET, MIC FPC	
5	DA2-1007-000 000	B	2	SEAL, R COVER	
5	DA2-1008-000 000	B	1	CUSHION, BATTERY	
5,7	DA2-1009-000 000	B	3	CUSHION, LCD	
13	DA2-1012-000 000	C	1	SHEET, FPC	
5	DA2-1014-000 000	B	1	LABEL, CAUTION	
3,13	DA2-1015-000 000	F	6	SCREW	
3	DA2-1016-000 000	F	2	SCREW	
3	DA2-1017-000 000	F	2	SCREW	
3	DA2-1018-000 000	F	1	SCREW	
13	DA2-1019-000 000	B	1	SEAL, MAGNET	
3,13	DA2-1020-000 000	C	3	MAGNET	
3	DA2-1021-000 000	C	1	SEAL, LCD T	
3	DA2-1023-000 000	C	1	CUSHION	
3	DA2-1024-000 000	C	1	CUSHION	
5	DA2-1025-000 000	C	2	CUSHION	
15	DA2-1026-000 000	C	2	CUSHION	
11	DA2-1027-000 000	C	1	SHEET, AUDIO 1	
11	DA2-1028-000 000	C	1	SHEET, AUDIO 2	
11	DA2-1151-000 000	C	1	CUSHION	
11	DA2-1152-000 000	C	1	CUSHION	
7	DA2-1156-000 000	C	1	GUIDE, C ARM	NEW
11	DA2-1158-000 000	C	1	SHEET, SDRAM	
15	DA2-1159-000 000	F	1	WASHER	
13	DA2-1160-000 000	B	1	SHEET, LCD FPC	
7	DA2-1451-000 000	B	1	COVER, LEFT	NEW

## PARTS LIST

PAGE	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
3	DA2-1452-000 000	B	1	FRONT COVER ASS'Y	NEW
3	DA2-1453-000 000	B	1	COVER, REMOCON WINDOW	NEW
3	DA2-1454-000 000	B	1	COVER, TALLY WINDOW	NEW
3	DA2-1455-000 000	F	2	SCREW	NEW
5	DA2-1461-000 000	B	1	COVER, RIGHT	NEW
5	DA2-1462-000 000	B	1	COVER, GRIP	NEW
13	DA2-1463-000 000	B	1	COVER, LCD TOP	NEW ELURA20 MC A
13	DA2-1464-000 000	B	1	COVER, LCD BOTTOM	NEW
3	DA2-1465-000 000	B	1	COVER, LCD HOLDER U	NEW
3	DA2-1466-000 000	B	1	COVER, LCD HOLDER L	NEW
5	DA2-1467-000 000	B	1	TAPE, GRIP COVER	NEW
5	DA2-1470-000 000	C	1	SHEET, INSULATION	NEW
7	DA2-1471-000 000	B	1	STRAP, HAND	NEW
5	DA2-1472-000 000	B	1	HOLDER, HAND STRAP	NEW
3	DA2-1473-000 000	B	1	COVER, MIC	NEW
9	DA2-1474-000 000	B	1	COVER, M DIAL	NEW ELURA20 MC A
9	DA2-1477-000 000	B	1	COVER, M DIAL	NEW ELURA10 A
3	DA2-1479-000 000	B	1	KNOB, EJECT	NEW
9	DA2-1483-000 000	B	1	COVER, CASSETTE REAR	NEW
9	DA2-1485-000 000	B	1	KNOB, OPEN	NEW
9	DA2-1486-000 000	B	1	KNOB, AP	NEW
9	DA2-1487-000 000	B	1	KNOB, FE	NEW
13	DA2-1498-000 000	B	1	COVER, LCD TOP	NEW ELURA10 A
3	DA2-1504-000 000	B	1	COVER, AV	NEW
5	DA2-1506-000 000	C	1	SHEET, JACK	NEW
19	DF1-1514-000 000	C	1	IDLER GEAR ASS'Y	
25	DF1-1516-000 000	C	1	GEAR, CAM 1	
23	DF1-1517-000 000	C	1	PLATE, DRIVE GEAR	
25	DF1-1518-000 000	C	1	LEVER ASS'Y, MODE	
25	DF1-1520-000 000	C	1	LEVER ASS'Y, PR CONTROL	
25	DF1-1522-000 000	C	1	LEVER, SLIDE	
25	DF1-1525-000 000	C	1	GEAR ASS'Y, TRANS.	
23	DF1-1544-000 000	C	1	T GUIDE ROLLER ASS'Y	
23	DF1-1545-000 000	C	2	SKATE ASS'Y	
23	DF1-1546-000 000	C	1	ARM ASS'Y, S	
23	DF1-1547-000 000	C	1	ARM ASS'Y, T	
21	DF1-1548-000 000	C	1	TENSION ARM ASS'Y	
21	DF1-1549-000 000	C	1	TENSION BRAKE ASS'Y	
23	DF1-1550-000 000	C	1	S GUIDE ROLLER ASS'Y	
23	DF1-1551-000 000	C	1	DRUM BASE ASS'Y	
21	DF1-1566-000 000	C	1	BRAKE, T SUB	
23	DF1-1567-000 000	C	1	LEVER ASS'Y, S MODE	
19	DF1-1569-000 000	C	1	CASSETTE COVER ASS'Y	
7	DF1-1624-000 000	C	1	CASSETTE ARM ASS'Y	
17	DF1-1628-000 000	C	1	CVF LEVER ASS'Y	
3	DF1-1630-000 000	B	1	LENS RING ASS'Y	
19	DG1-3857-000 000	C	1	DRIVE GEAR ASS'Y	
23	DG1-3858-000 000	C	1	ARM ASS'Y, PINCH ROLLER	
21	DG1-3859-000 000	C	1	REVIEW ARM ASS'Y	
25	DG1-3860-000 000	C	1	GEAR, MODE	
19	DG1-3861-000 000	C	1	CASSETTE HOLDER ASS'Y	
23	DG1-3865-000 000	C	1	LOADING MOTOR ASS'Y	
11	DG1-3978-000 000	C	1	FPC ASS'Y, SUB-DMC	
11	DG1-4023-050 000	C	1	PCB ASS'Y, AUDIO	NEW
13	DG1-4024-000 000	C	1	PCB ASS'Y, LCD	
15	DG1-4025-000 000	C	1	PCB ASS'Y, CCD	
15	DG1-4026-000 000	C	1	PCB ASS'Y, CA	
17	DG1-4027-000 000	C	1	PCB ASS'Y, CVF	
11	DG1-4028-000 000	C	1	PCB ASS'Y, MULTI	
9	DG1-4029-000 000	C	1	PCB ASS'Y, LITHIUM	

## PARTS LIST

PAGE	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
	11 DG1-4051-000 000	C	1	FPC ASS'Y, JACK	
	13 DG1-4052-000 000	C	1	FPC ASS'Y, LCD SW	
	9 DG1-4054-000 000	C	1	FPC ASS'Y, FE	
	11 DG1-4056-000 000	C	1	MIC ASS'Y	
	3 DG1-4062-000 000	B	1	ZOOM SWITCH ASS'Y	
	13 DG1-4065-000 000	C	1	HINGE ASS'Y, LCD	
	15 DG1-4066-000 000	C	1	LENS ASS'Y	
	17 DG1-4067-000 000	C	1	BACKLIGHT ASS'Y (CVF)	
	7 DG1-4078-000 000	B	1	COVER ASS'Y, MMC	ELURA20 MC A
	5 DG1-4079-000 000	C	1	BATTERY TERMINAL ASS'Y	
	3 DG1-4096-000 000	B	1	EYE PIECE ASS'Y	
	5 DG1-4097-000 000	B	1	RECORDER KEY ASS'Y	ELURA10 A
	7 DG1-4289-000 000	C	1	PCB ASS'Y, MMC	NEW ELURA20 MC A
	7 DG1-4290-000 000	C	1	PCB ASS'Y, MMC	NEW ELURA10 A
	9 DG1-4309-000 000	B	1	MAIN DIAL ASS'Y	NEW ELURA20 MC A
	9 DG1-4312-000 000	B	1	MAIN DIAL ASS'Y	NEW ELURA10 A
	3 DG1-4314-000 000	B	1	REAR COVER ASS'Y	NEW
	5 DG1-4316-000 000	B	1	RECORDER KEY ASS'Y	NEW ELURA20 MC A
	13 DG1-7377-000 000	C	1	BACKLIGHT ASS'Y (LCD)	
	23 DH2-2115-000 000	C	1	FPC, LOADING MOTOR	
	11 DH2-2174-000 000	C	1	FPC ASS'Y, MULTI-AUDIO	
	11 DH2-2175-000 000	C	1	FPC ASS'Y, SUB-MAIN	
	13 DH2-2177-000 000	C	1	FPC, LCD-MAIN	
	15 DH2-2178-000 000	C	1	FPC ASS'Y, CA-MAIN	
	17 DH2-2179-000 000	C	1	FPC ASS'Y, CVF-MAIN	
	11 DH2-2182-000 000	C	1	FPC ASS'Y, HA SHIELD	
	5 DH2-2183-000 000	C	1	FPC, BATTERY	
	7 DH2-4055-000 000	C	1	FPC, MMC-MAIN	
	21 DH9-0812-000 000	C	1	TAPE DETECTION SW ASS'Y	
*1	13 DH9-0831-000 000	C	1	LCD ASS'Y	
	15 DH9-0836-000 000	C	1	FILTER, IR	
	21 DS1-0169-000 000	C	1	SPRING, COIL	
	21 DS1-0172-000 000	C	1	SPRING, COIL	
	21 DS1-0173-000 000	C	1	SPRING, COIL	
	23 DS1-0174-000 000	C	1	SPRING, COIL	
	21 DS1-0175-000 000	C	1	SPRING, COIL	
5,13	DS1-5380-000 000	C	2	SPRING, COIL	
	9 DS1-5385-000 000	C	1	SPRING, COIL	
	17 DS1-5386-000 000	C	1	SPRING, COIL	
	3 DS1-5387-000 000	C	1	SPRING, COIL	
	27 DY1-8119-000 000	C	1	LABEL, WIRELESS CONTROLLER (A)	
	27 DY1-8121-000 000	C	1	COVER, BATTERY	
	19 DY1-8210-000 000	C	1	MAIN CHASSIS ASS'Y	
	21 DY1-8211-000 000	C	1	SLIDE CHASSIS ASS'Y	
	15 DY1-8271-000 000	C	1	CCD ASS'Y	
	11 DY1-8273-000 000	C	1	PCB ASS'Y, SUB	
*2	13 DY1-8274-000 000	C	1	LCD ASS'Y	
	27 DY1-8276-000 000	C	1	COVER, TERMINAL BP-406	
	11 DY1-8282-000 000	C	1	RECORDER UNIT DMC II	
	19 DY1-8283-000 000	E	1	DRUM ASS'Y (3CH)	
	11 DY1-8379-000 000	C	1	PCB ASS'Y, MAIN	NEW ELURA20 MC A
	11 DY1-8381-000 000	C	1	PCB ASS'Y, MAIN	NEW ELURA10 A
	27 DY1-8383-000 000	C	1	CARD, SD SDC-8M	ELURA20 MC A
	VS1-6307-014 000	C	1	CONNECTOR, 14P	
	VS1-6640-021 000	C	1	CONNECTOR, 21P	
	VS1-6640-025 000	C	1	CONNECTOR, 25P	
	VS1-6640-027 000	C	4	CONNECTOR, 27P	
	VS1-6640-031 000	C	1	CONNECTOR, 31P	
	VS1-6674-005 000	C	1	CONNECTOR, 5P	
	VS1-6674-006 000	C	1	CONNECTOR, 6P	

## PARTS LIST

PAGE	PART NO.	CLASS	Q'TY	DESCRIPTION	REMARKS
△	WC4-5155-000 000	C	1	SWITCH, TRIGGER	
	WC5-5134-000 000	C	1	SWITCH, DIAL	
	WD1-5062-000 000	D	2	FUSE	
	17 WG2-5194-000 000	C	1	LCD ASS'Y, CVF	
	WS1-5524-000 000	C	1	JACK, A/V	
	WS1-5879-000 000	C	1	CONNECTOR, DV	
23,25	XA1-7140-147 000	F	5	SCREW	
3	XA1-7140-207 000	F	2	SCREW	
7	XA1-7170-207 000	F	5	SCREW	
3,7,11,13	XA1-7170-257 000	F	15	SCREW	
3,5,7	XA1-7170-307 000	F	7	SCREW	
3,7	XA1-7170-357 000	F	4	SCREW	
3	XA1-7170-407 000	F	1	SCREW	
7	XA1-7170-607 000	F	1	SCREW	
5	XA1-7200-457 000	F	2	SCREW	
7	XA4-9140-287 000	F	1	SCREW	
17	XA4-9170-309 000	F	1	SCREW	
17	XA4-9170-357 000	F	1	SCREW	
3,13	XA4-9170-359 000	F	2	SCREW	
15	XA4-9170-407 000	F	5	SCREW	
13	XA4-9170-409 000	F	2	SCREW	
5	XA4-9170-457 000	F	1	SCREW	
15	XA4-9170-609 000	F	2	SCREW	
5,7	XA9-1000-000 000	F	4	SCREW	
3,7,11	XA9-1001-000 000	F	7	SCREW	
7	XA9-1002-000 000	F	2	SCREW	
7,9	XA9-1004-000 000	F	3	SCREW	
11	XA9-1167-000 000	F	2	SCREW	
3,11	XA9-1244-000 000	F	3	SCREW	
9	XA9-1252-000 000	F	1	SCREW	
11	XA9-1260-000 000	F	1	SCREW	
7	XA9-1274-000 000	F	1	SCREW	
15	XD1-1101-825 000	F	1	WASHER	
23	XD2-1100-102 000	C	1	E RING	
15	YH7-0200-000 000	C	1	MOTOR, PZ	
15	YH7-0201-000 000	C	1	MOTOR, AF	
15	YH8-0097-000 000	C	1	IG METER ASS'Y	

# CHAPTER 6. BLOCK DIAGRAMS

## CONTENTS

INTERCONNECTION DIAGRAM

BLOCK DIAGRAMS

CAMERA SECTION-1

CAMERA SECTION-2

SYSCON SECTION

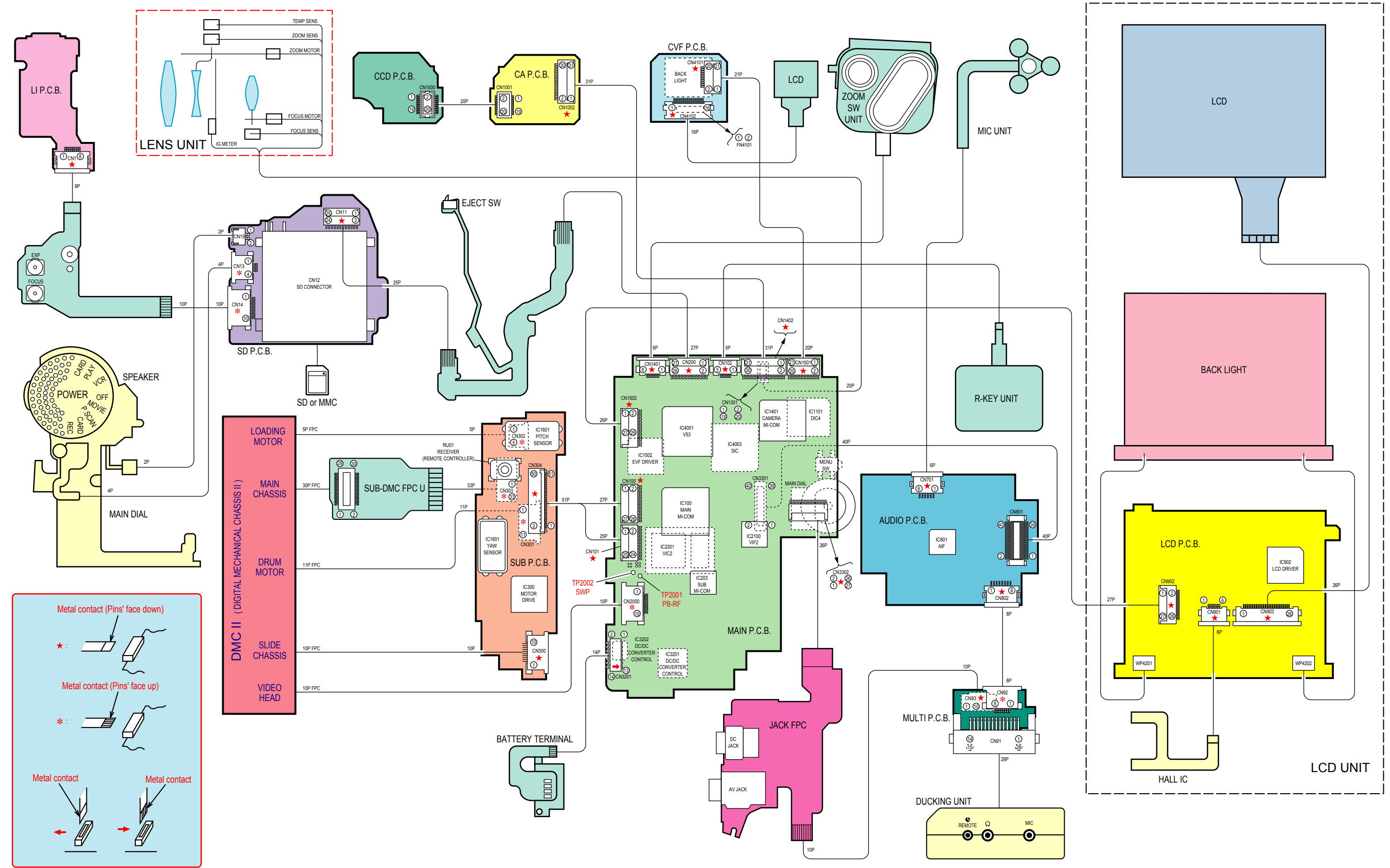
SERVO SECTION

AUDIO SECTION

VIDEO SECTION

LCD SECTION

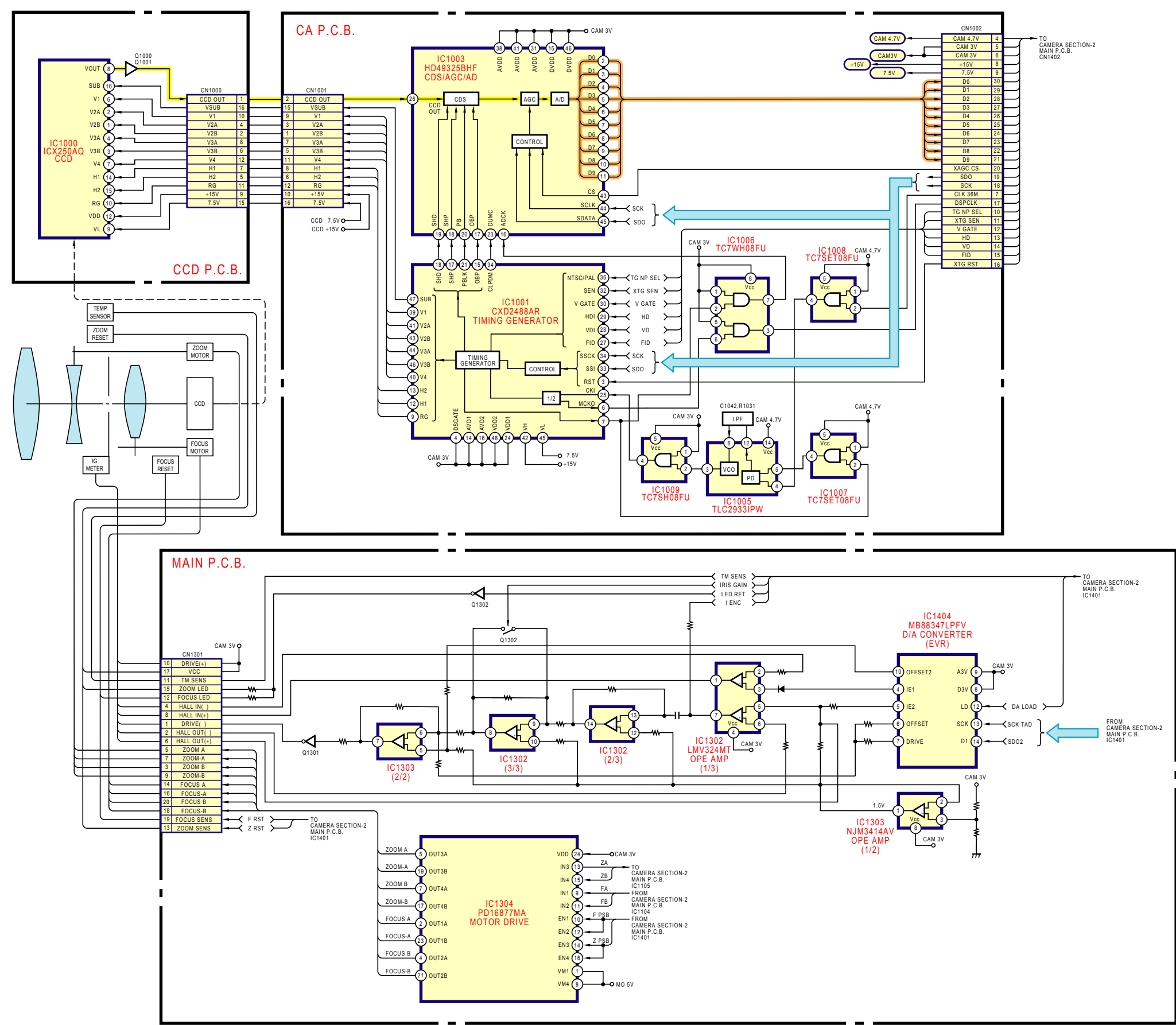
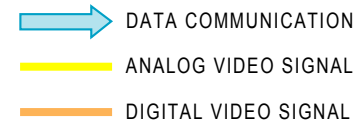


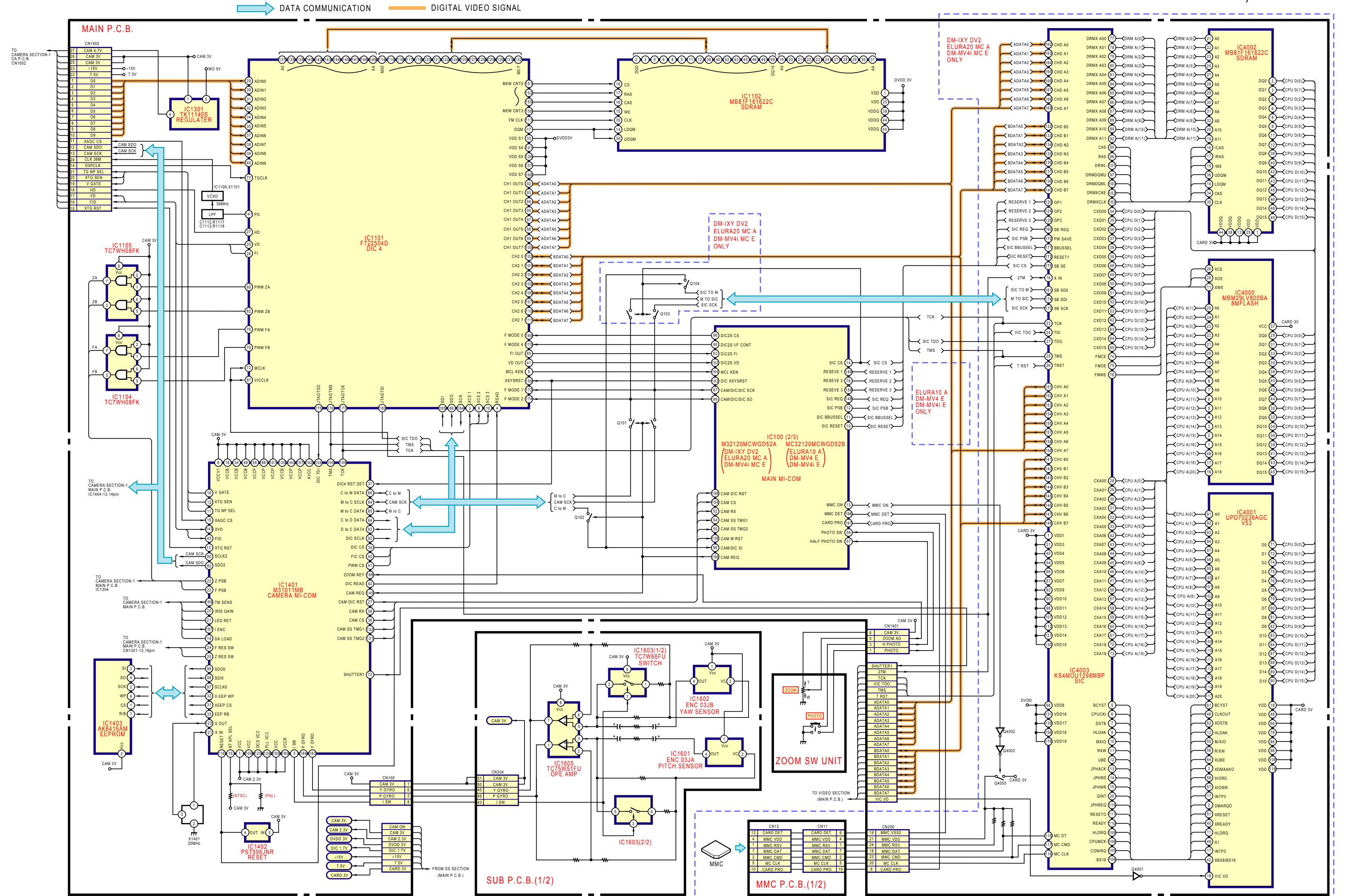


# INTERCONNECTION DIAGRAM

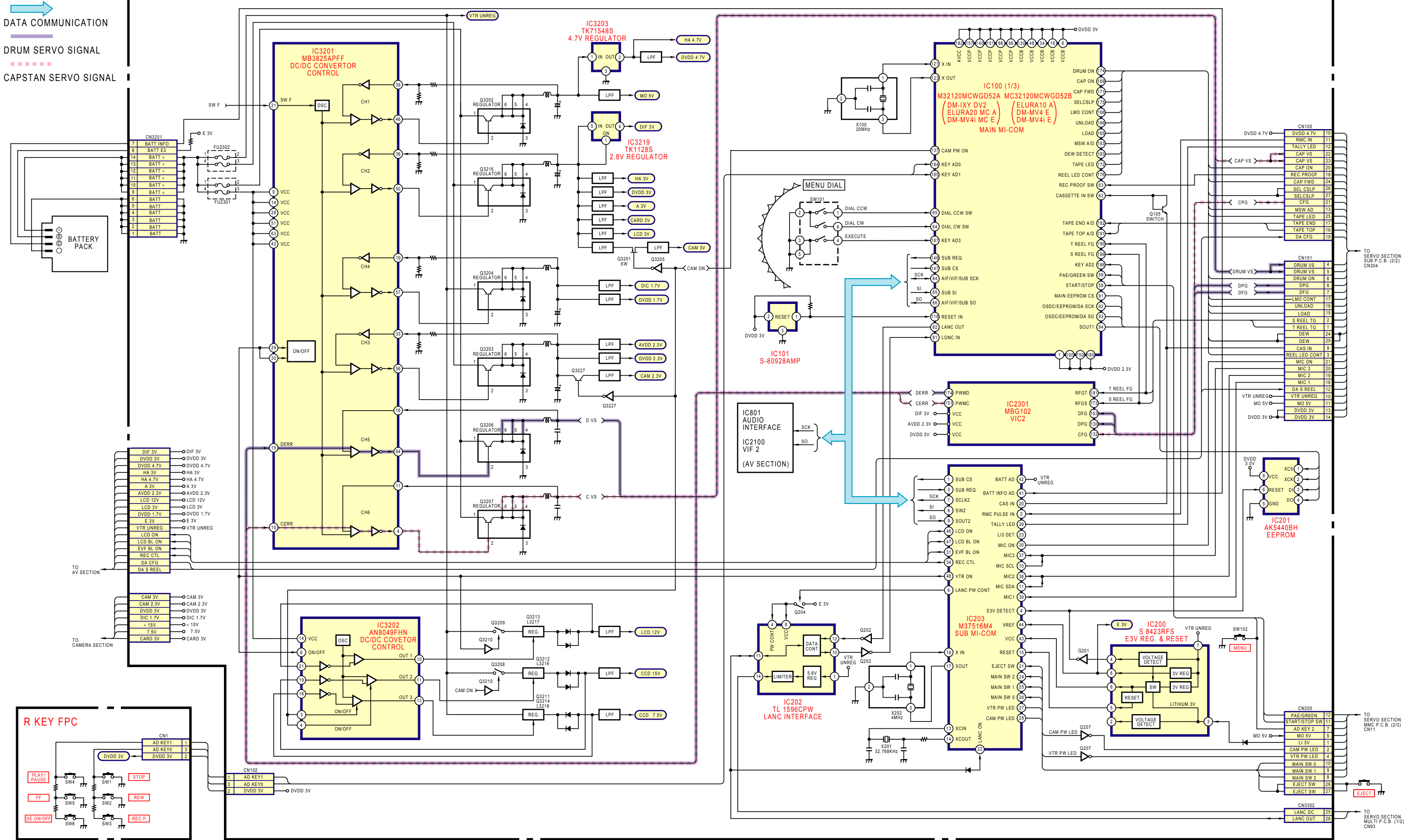
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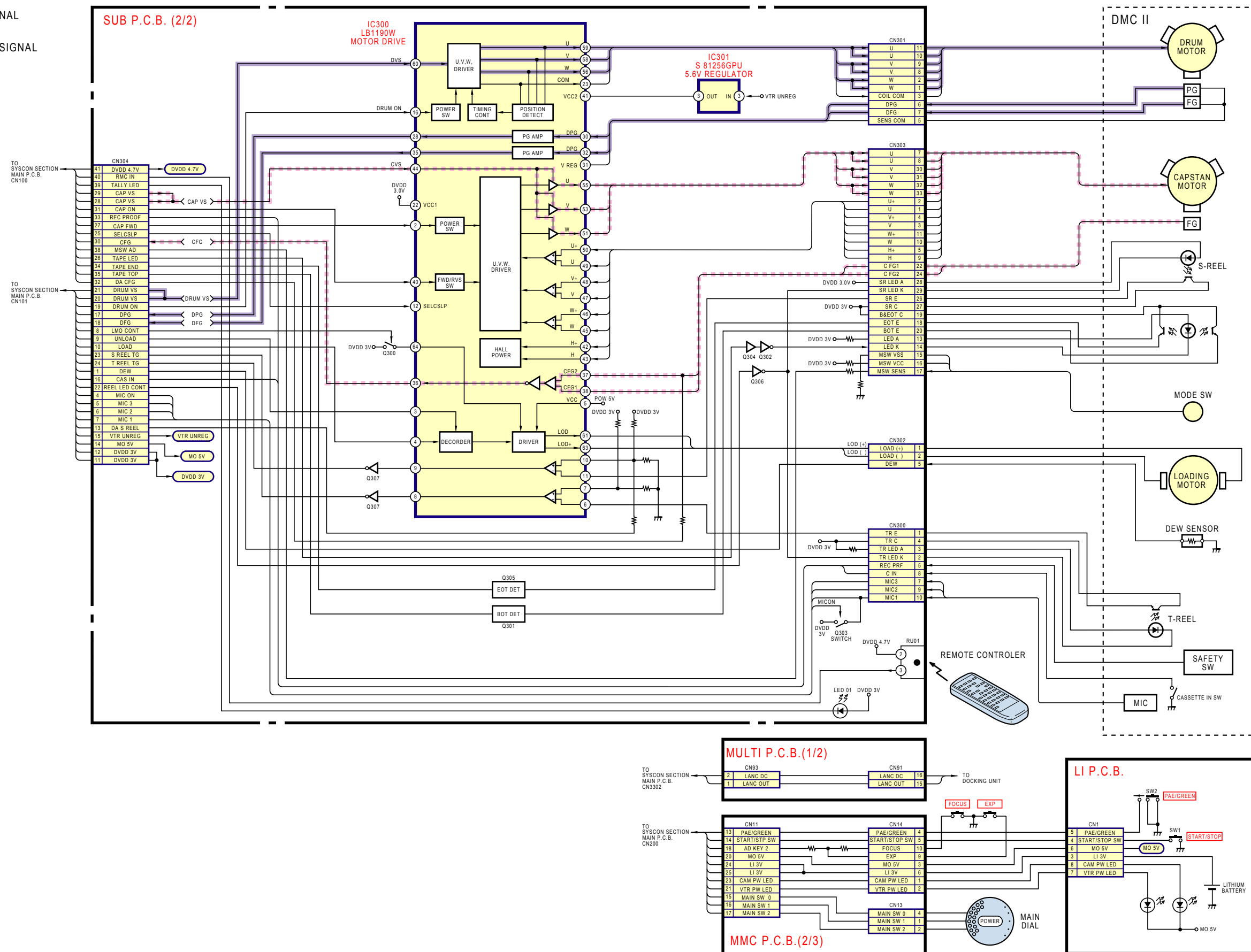
LI P.C.B.	CVF P.C.B.	SUB P.C.B.	MAIN P.C.B.	MAIN P.C.B.	MAIN P.C.B.	AUDIO P.C.B.	LCD P.C.B.
<b>CN1</b>	<b>CN4101</b>	<b>CN300</b>	<b>CN100</b>	<b>CN1402</b>	<b>CN3301</b>	<b>CN701</b>	<b>CN901</b>
1 GND	1 GND	1 MIC1	1 CAN 3V	1 D0	1 GND	1 GND	1 PNL BT SW
2 GND	2 GND	2 MIC2	2 P GYRO	2 D1	2 GND	2 Lch	2 V GND
3 LI 3V	3 BL 5V	3 C IN	3 P OFFSET	3 D2	3 GND	3 Rch	3 LCD 3V
4 START/STOP SW	4 BL 5V	4 MIC3	4 GND	4 D3	4 GND	4 GND	4 PNL OPEN SW
5 PAE/GREEN	5 COM	5 GND	5 D4	5 AUDIO R	5 Cch	5 GND	5 V GND
6 MOSV	6 G	6 REC PRF	6 Y GYRO	6 D5	6 AUDIO L	6 GND	6 LCD 3V
7 VTR POWER LED	7 R	7 TR C	7 Y OFFSET	7 D6	7 A 3V	<b>CN801</b>	<b>CN902</b>
8 CAM POWER LED	8 B	8 TR LED A	8 I SW	8 D7	8 A 3V		
BT1	9 BLK	9 TR LED K	9 GND	9 D8	9 GND		
1 LI+	10 HCK1	10 TR E	10 DVDD 4.7V	10 D9	10 GND		
BT2	11 HCK2	<b>CN301</b>	11 RMC IN	11 XAGC CS	11 AUD I		
1 LI GND	12 HST	1 W	12 TALLY LED	12 CAM SDO	12 GND	5 AUDIO R	5 GND
<b>CCD P.C.B.</b>	13 RGT	2 W	13 CAM SCLK	13 CAM SCLK	13 AMCLK	6 AUDIO L	6 C SYNC
	14 DWN	3 COIL COM	14 GND	14 DSPCLK	14 AUD O	7 A 3V	7 SCLK1
	15 EN	4 GND	15 GND	15 XTG RST	15 LACK	8 A 3V	8 SOUT1
	16 STB	5 SENS COM	16 TAPE TOP	16 FID	16 WCK	9 GND	9 SIN1
	17 VCK	6 DPG	17 TAPE END	17 VD	17 GND	10 GND	10 LCD EEP CS
1 CCD OUT	18 VST	7 DFG	18 REC PROOF	18 HD	18 GND	11 AUD I	11 LCD CEN
2 V2B	19 VSS	8 V	19 DA CFG	19 VGATE	19 GND	12 GND	12 PNL OPEN SW
3 GND	20 VDD	9 V	20 CAP ON	20 XTG SEN	20 GND	13 AMCLK	13 PNL BT SW
4 V2A	21 VDD	10 U	21 CFG	21 TG NP SEL	21 SP	14 AUD O	14 LCD ON
5 H2	<b>CN4102</b>	11 U	22 CAP VS	22 CCD 7.5V	22 SP+	15 LACK	15 LCD BL DN
6 V3B	1 VDD	<b>CN302</b>	23 CAP VS	23 CCD 15V	23 VTR UNREG	16 WCK	16 LCD 12V
7 H1	2 VSS	1 LOAD (+)	24 CAP FWD	24 36M	24 VTR UNREG	17 GND	17 COM ADJ
8 V3A	3 VST	2 LOAD (-)	25 TAPE LED	25 CAM 3V	25 SCLK2	18 GND	18 PLL ADJ
9 +15V	4 VCK	3 NC	26 SELCSLP	26 CAM 3V	26 SOUT2	19 GND	19 LCD 3V
10 V1	5 TEST2 (STB)	4 GND	27 SELCSLP	27 CAM 4.7V	27 DVDD 3V	20 GND	20 LCD 3V
11 RG	6 EN	5 DEW	<b>CN101</b>	28 GND	28 AIF CS	21 SP	21 LCD UNREG
12 V4	7 TEST1 (DWN)	<b>CN303</b>	1 T REEL FG	29 GND	29 A EMP1	22 SP +	22 LCD UNREG
13 GND	8 RGT	1 W	2 S REEL FG	30 GND	30 XPD DA	23 VTR UNREG	23 LCD UNREG
14 GND	9 HST	2 W	3 REEL LED CONT	31 GND	31 BEEP LEV	24 VTR UNREG	24 GND
15 7.5V	10 HCK2	3 V	4 DRUM VS	<b>CN1501</b>	32 SHUTTER 1	25 SCLK2	25 GND
16 SUB	11 HCK1	4 V	5 DRUM VS	1 VDD	33 BEEP 2	26 SOUT2	26 GND
17 NC	12 BLK	5 SR LED K	6 DRUM ON	2 VSS	34 BEEP 1	27 DVDD3V	27 NC
18 NC	13 B	6 SR LED A	7 DFG	3 VST	35 XPD AD	28 AIF CS	<b>CN903</b>
19 NC	14 R	7 SR C	8 DPG	4 VCK	36 A MUTE	29 A EMP1	1 NC
20 NC	15 G	8 SR E	9 CAS IN	5 STB	37 AUD ON	30 XPD DA	2 CKH1
	16 COM	9 GND	10 VTR UNREG	6 EN	38 A EMP2	31 BEEP LEV	3 CKH2
<b>CA P.C.B.</b>	<b>FN4101</b>	10 CFG2	11 MO 5V	7 DWN	39 DVDD 4.7V	32 SHUTTER1	4 PCG
<b>CN1001</b>	1 BL 5V	12 CFG1	12 DA SPEEL	8 RGT	40 EXT CONT	33 BEEP2	5 XPCG
1 V2B	2 LED	13 CFG VCC	13 DVDD 3V	9 HST	<b>CN3302</b>	34 BEEP1	6 HVDD
2 CCD OUT	<b>MMC P.C.B.</b>	14 BOT E	14 LOAD	10 HCK2	1 XTPA	35 XPD AD	7 STH
3 V2A	<b>CN11</b>	15 B EOT C	15 UNLOAD	11 HCK1	2 XTPB	36 A MUTE	8 XSTH
4 GND	1 MMC RSV	16 EOT E	16 LMO CONT	12 BLK	3 TPB	37 AUD ON	9 HVSS
5 V3B	2 MMC CMD	17 MSW SENS	17 MIC1	13 B	4 TPA	38 A EMP2	10 CSH
6 H2	3 GND	18 MSW VCC	18 MIC2	14 R	5 GND	39 DVDD4.7V	11 G
7 V3A	4 MMC VDD	19 MSW VSS	19 MIC3	15 G	6 GND	40 EXT CONT	12 R
8 H1	5 MMC CLK	20 LED K	20 MIC3	16 COM	7 AUDIO R	<b>CN802</b>	13 B
9 V1	6 CARD DET	21 LED A	21 MIC ON	17 BL 5V	8 GND	1 M GND	14 PCD
10 +15V	7 MMC DAT	22 GND	22 GND	18 BL 5V	9 GND	2 M Lch	15 NC
11 V4	8 LAC OUT	23 WH+	23 GND	19 GND	10 GND	3 M Rch	16 CSV
12 RG	9 GND	24 W	24 DEW	20 GND	11 AUDIO L	4 M GND	17 VVDD
13 GND	10 GND	25 H	25 DEW	21 NC	12 GND	5 M GND	18 ENB
14 GND	11 SP +	26 U	<b>CN102</b>	<b>CN1502</b>	13 PLUG IN	6 HP COM	19 XENB
15 SUB	12 SP	27 U	1 AD KEY1	1 GND	14 V I/O	7 HP Lch	20 VVSS
16 7.5V	13 PAE/GREEN	28 GND	2 DVDD 3V	2 GND	15 GND	8 HP Rch	21 STV
17 NC	14 START/STOP SW	29 H+	3 AD KEY0	3 GND	16 GND	<b>MULTI P.C.B.</b>	22 XSTV
18 NC	15 MAIN SW0	30 V+	4 NC	4 LCD UNREG	17 V I/O	<b>CN91</b>	23 CKV1
19 NC	16 MAIN SW1	31 V	5 GND	5 LCD UNREG	18 GND	1 GND	24 CKV2
20 NC	17 MAIN SW2	32 U+	<b>CN200</b>	6 LCD UNREG	19 GND	2 EXT MIC L	25 COM
<b>CN1002</b>	18 MAIN SW2	33 U	1 LI 3V	7 LCD 3V	20 C I/O	3 EXT MIC R	26 NC
1 GND	19 CARD PRO	<b>CN304</b>	2 CAM POWER LED	8 LCD 3V	21 S DET	4 GND	
2 GND	20 MO 5V	1 DEW	3 VTR POWER LED	9 PLL ADJ	22 EXT DET	5 GND	
3 GND	21 CAM 3V	2 GND	4 CAM 3V	10 COM ADJ	23 HP DET	6 HP COM	
4 CAM 4.7V	22 CAM 3V	3 GND	5 CAM 3V	11 LCD 12V	24 GND	7 HP L	
5 CAM 3V	23 CAM POWER LED	4 MIC ON	6 CAM PRO	12 LCD BL ON	25 LANC DC	8 HP R	
6 36M	24 LI 3V	5 MIC3	7 AD KEY2	13 LCD ON	26 LANC OUT	9 GND	
7 +15V	25 LI 3V	6 MIC2	8 MAIN SW1	14 PNL BT SW	27 NC	10 GND	
8 7.5V	<b>CN12</b>	7 MIC1	9 MAIN SW2	15 PNL OPEN SW	<b>CN2000</b>	11 GND	
9 TG NP SEL	1 MMC RSV	8 LMO CONT	10 START/STOP SW	16 LCD EEP CS	1 HA GND	12 GND	
10 XTG SEN	2 MMC CMD	9 UNLOAD	11 PAE/GREEN	17 SIN1	2 H1A	13 GND	
11 VGATE	3 GND	10 LOAD	12 SP	18 SOUT1	3 H1B	14 GND	
12 HD	4 MMC VDD	11 DVDD 3V	13 SP +	19 SOUT1	4 HA GND	15 LANC OUT	
13 VD	5 MMC CLK	12 DVDD 3V	14 GND	20 SCLK1	5 H2A	16 LANC DC	
14 FID	6 GND	13 DA SREEL	15 GND	21 C SYNC	6 H2B	17 GND	
15 XTG RST	7 MMC DAT	14 MO 5V	16 GND	22 GND	7 HA GND	18 HP DET	
16 DSPCLK	8 MMC DAT1	15 VTR UNREG	17 LANC OUT	23 GND	8 H3A	19 EXT DET	
17 CAM SCLK	9 MMC DAT2	16 CAS IN	18 PANEL B	24 PANEL B	9 H3B	20 S DET	
18 CAM SDO	10 CARD PRO	17 DPG	19 MMC VSS2	25 PANEL G	10 HA GND	21 C I/O	
19 XAGC CS	11 GND	18 DFG	20 MMC CLK	26 PANEL R	<b>CN2001</b>	22 GND	
20	12 CARD DET	19 DRUM ON	21 MMC VDD	27 NC	1 BATT	23 Y I/O	
21	<b>CN13</b>	20 DRUM VS	22 GND	<b>CN2002</b>	2 BATT	24 GND	
22 D8	1 MAIN SW1	21 DRUM VS	23 REEL LED CONT	1 HA GND	3 BATT	25 GND	
23 D7	2 MAIN SW2	22 REEL LED CONT	23 S REEL FG	2 H1A	4 BATT	26 GND	
24 D6	3 GND	23 S REEL FG	24 T REEL FG	3 H1B	5 BATT	27 GND	
25 D5	4 MAIN SW0	24 T REEL FG	25 SELCSLP	4 HA GND	6 BATT	28 GND	
26 D4	<b>CN14</b>	25 SELCSLP	26 TAPE LED	5 H2A	7 BATT	<b>CN92</b>	
27 D3	1 CAM POWER LED	27 CAP FWO	27 CAP FWO	6 H2B	8 BATT	1 GND	
28 D2	2 VTR POWER LED	28 CAP VS	28 CAP VS	7 HA GND	9 H3B	2 EXT MIC L	
29 D1	3 MO 5V	29 CAP VS	29 CAP VS	8 H3A	10 HA GND	3 EXT MIC R	
30 D0	4 PAE/GREEN	30 CFG	30 CFG	<b>CN2003</b>	<b>CN2001</b>	4 GND	
31 DO	5 START/STOP SW	31 CAP ON	31 CAP ON	1 BATT	1 BATT	5 GND	
	6 LI 3V	32 DA CFG	32 DA CFG	2 BATT	2 BATT	6 HP COM	
	7 GND	33 REC PROOF	33 REC PROOF	3 BATT	3 BATT	7 HP L	
	8 GND	34 TAPE END	34 TAPE END	4 BATT	4 BATT	8 HP R	
	9 EXP	35 TAPE TOP	35 TAPE TOP	5 BATT	5 BATT	9 GND	
	10 FOCUS	36 GND	36 GND	6 BATT	6 BATT	10 GND	
	<b>CN15</b>	37 GND	37 GND	7 BATT INFO AD	7 BATT	<b>CN93</b>	
	1 SP	38 MSW AD	38 MSW AD	8 BATT E3	8 BATT	1 LANC OUT	
	2 SP +	39 TALLY LED	39 TALLY LED	9 BATT +	9 BATT	2 LANC DC	
		40 RMC IN	40 RMC IN	10 BATT +	10 BATT	3 GND	
		41 DVDD 4.7V	41 DVDD 4.7V	11 BATT +	11 BATT	4 HP DET	
		42 GND	42 GND	12 BATT +	12 BATT	5 EXT DET	
		43 I SW	43 I SW	13 BATT +	13 BATT	6 S DET	
		44 Y OFFSET	44 Y OFFSET	14 BATT +	14 BATT	7 C I/O	
		45 Y GYRO	45 Y GYRO			8 GND	
		46 CAM GND	46 CAM GND			9 Y I/O	
		47 CAM GND	47 CAM GND			10 GND	
		48 P OFFSET	48 P OFFSET				
		49 P GYRO	49 P GYRO				
		50 CAM 3V	50 CAM 3V				
		51 CAM 3V	51 CAM 3V				
		6 CK 3V	6 CK 3V				



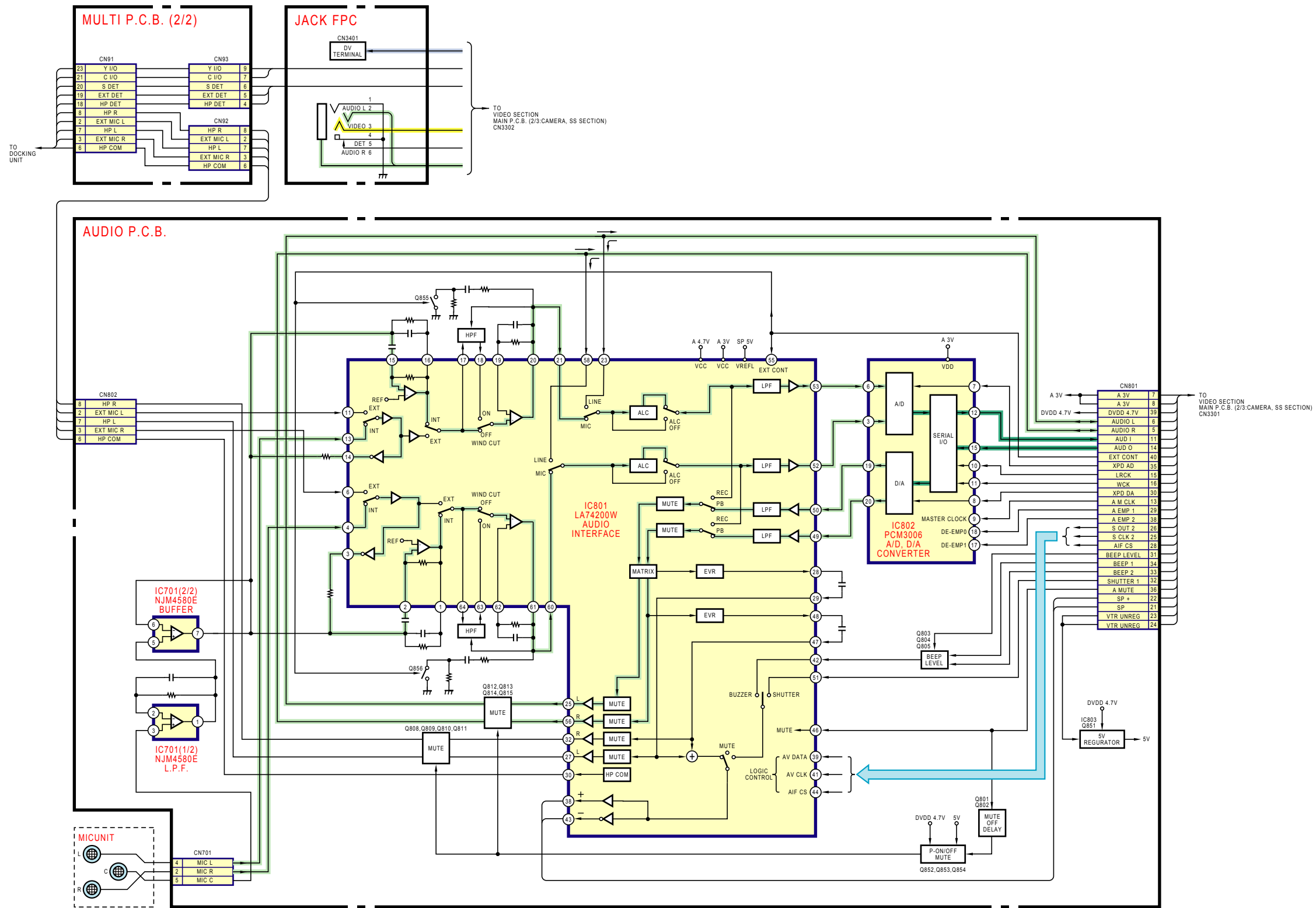




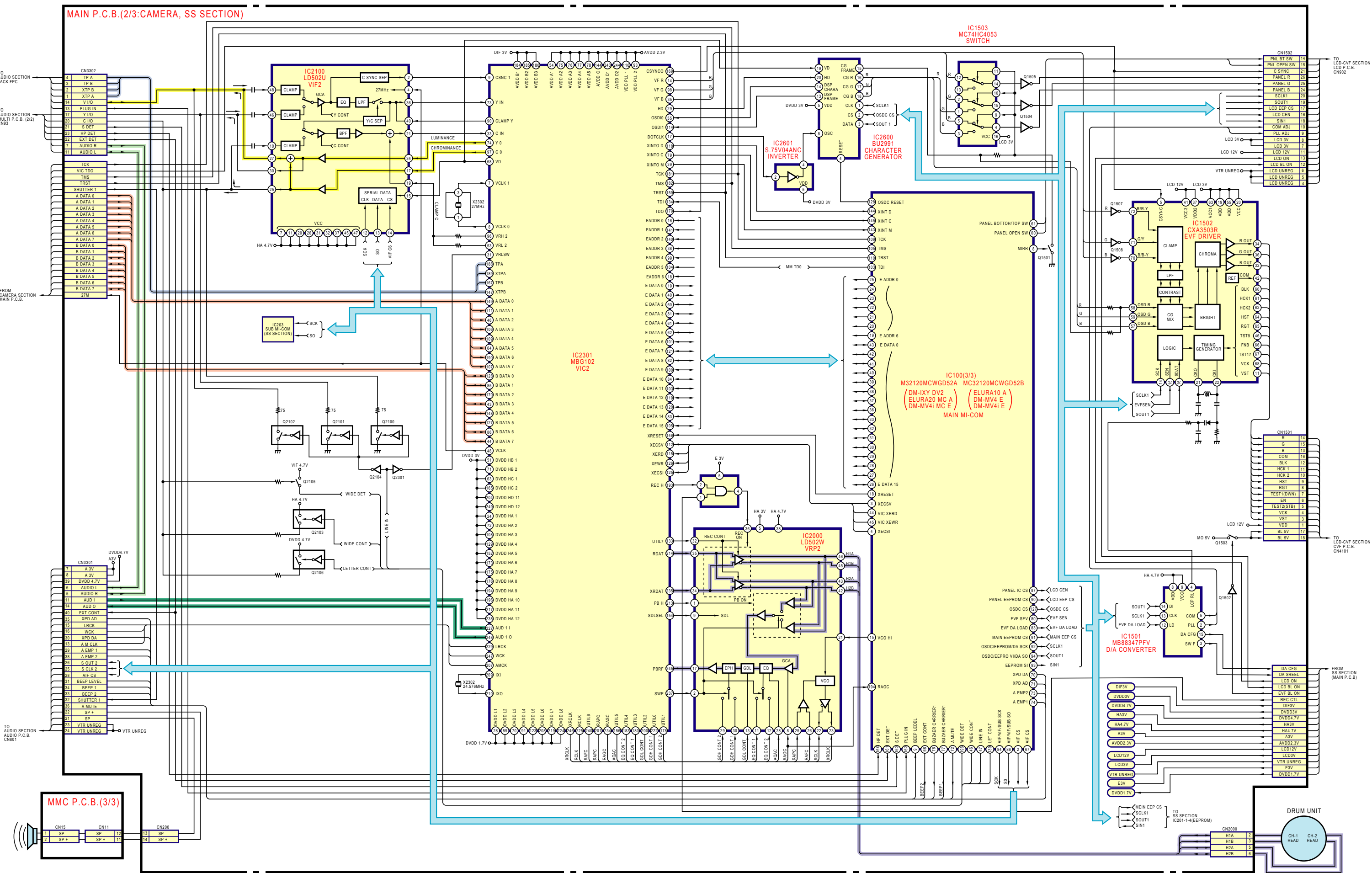




- DATA COMMUNICATION
- ANALOG VIDEO SIGNAL
- ANALOG AUDIO SIGNAL
- DIGITAL AUDIO SIGNAL
- DV SIGNAL



DATA COMMUNICATION  
ANALOG VIDEO SIGNAL  
DIGITAL VIDEO SIGNAL  
ANALOG AUDIO SIGNAL  
DIGITAL AUDIO SIGNAL  
DIGITAL (VIDEO + AUDIO) SIGNAL  
DV SIGNAL





DATA COMMUNICATION

